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Original Articles

A CONSIDERATION OF THE ETIOLOGY AND DIETETIC TREATMENT OF INFANTILE ATROPHY.

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INTRODUCTION.

The condition known as infantile atrophy, athrepsia, or marasmus occurs so frequently and its consequences are so serious that it is of the utmost importance to obtain accurate knowledge of its pathology and nature, in the hope that such knowledge may furnish indications for treatment. The clinical manifestations have been described so many times that it is unnecessary to refer to them here, more especially as any physician in general practice must have seen such cases.

The condition begins, as a rule, in the first two or three months of life, and is caused by errors in the diet. It may be that the quantity of food is excessive, that the quality of the food is unsuitable, or that the food is given too frequently. As a rule, one finds a combination of several errors. In consequence of faulty diet, the digestion, as is shown by the character of the dejections, becomes impaired. The infant does not gain in weight as it should. In most cases there is a loss of weight down to a certain point, and after this the weight may remain more or less stationary for weeks or for months. A distinction has been made between these so-called primary cases, which occur in the first few weeks of life, and cases presenting the same symptoms and following the same course, which begin later in infancy in consequence of some acute disease, especially severe acute gastroenteric disturbance. Neither clinically nor anatomically can the cases be distinguished from one another, and there appears to be little reason for classifying them separately. This statement is not meant to include cases in which the emaciation is associated with chronic diseases, like tuberculosis and syphilis.

THEORIES OF CAUSATION.

The way in which a faulty diet produces a condition of atrophy is still unknown. It was assumed by Nothnagel[1] and later by Baginsky[2] that a more or less constant derangement of digestion in these cases ultimately caused atrophy of the intestines; consequently absorption became so much impaired that a general wasting of the body tissues ensued. In support of this view, Baginsky produced drawings illustrative of the microscopic appearances of the intestines in such cases. Heubner[3] denied the correctness of these observations and claimed that the microscopic appearances described by Baginsky were due to postmortem changes and to artefacts. He said that the loss of epithelium was due to postmortem alterations and showed that any obliquity in the cross-sections of intestines produced the appearance of shallower ducts, and that the thinness or thickness of the wall could be modified by the degree of distention or contraction of the intestines. In this way, areas of atrophy and hypertrophy were simulated. He exhibited photographs of sections of normal intestines distended and cut obliquely which were similar to the appearances described by Baginsky in cases of atrophy. Heubner believed that the condition of atrophy was due to severe functional disturbance. Heubner's views were sustained by the work of Gerlach,[4] published about the same time. In Gerlach's cases, a condition similar to that described by Baginsky was produced by means of postmortem alterations and varying degrees of distention and contraction of the intestines. Two years later Habel[5] published the results of investigations of this subject carried on under the supervision of Ribbert. There was scarcely a suggestion of atrophy of the intestines in the cases which he examined, and the results of his experiments on animals confirmed the statements of Heubner and of Gerlach.

Bloch[6] recently published the results obtained by him from the examination of three cases of infantile atrophy. Postmortem changes were avoided by injecting a quantity of 10 per cent. formalin solution into the peritoneal cavity immediately after death. Measurements were made of the stomach and intestines. Great care was exercised in the fixation and handling of the specimens. Serial sections were made of the tissues, and modern methods of staining were employed. There was no evidence of intestinal atrophy. The only abnormality to which he attached any importance was the condition of Paneth's cells. These cells, described by Paneth[7] in 1888, are found in Lieberkuhn's ducts. Under normal conditions, the presence of certain granules in the protoplasm of these cells is accepted as evidence that they are functioning. In Bloch's cases of atrophy the granules in the Paneth cells were, for the most part, absent, and from this Bloch concluded that the cells were not functioning. There was no appearance of degeneration of

1. Beiträge zur Physiologie u. Pathologie des Darmes. Berlin, 1884.

2. A. Baginsky: (cited by Bloch). Die Verdauungs Krankheiten der Kinder. Tübingen, 1884. Zur Kenntniss der atrophie der Sanglinge. Deuts. med. Woch., No. 18, 1899. Zur Pathologie der Darmtraktus. Arch. f. Kinderheilkunde. No. 32, 1901.

3. O. Heubner: (cited by Bloch). Ueber das Verhalten der Darmepithels bei Darmkrankheiten der Säuglinge, etc., Zeitsch. f. klin. Med., vol. xxix, 1896. Zur Kenntniss der Säuglings-Atrophie. Jahr. f. Kinderheilkunde. vol. liii, 1900.

4. W. Gerlach: (cited by Bloch). Kritische Bemerkungen zur gegenwärtigen Lehre von der Darmatrophie, Deuts. Arch. f. klin. Med., vol. lvii, 1896

5. A. Habel: (cited by Bloch) Ueber Darmatrophie, Virch. Arch. vol. cliii, 1898.

6. C. E. Bloch: (references to literature of atrophy) Die Säuglings-Atrophie und die Paneth'schen zellen, Jahr. f. Kinderheilkunde, vol. lix, 1904.

7. Paneth: cited by Bloch) Ueber die secernierenden Zellen des Dünndarmepithels. Arch. f. Mikroskop. Anat., vol xxxi, 1888.

Paneth's cells. Bloch attached great importance to the condition of the cells as a causative factor in the production of infantile atrophy. He referred to Pawlow's work on digestion and the important part which the "succus entericus" plays in assisting pancreatic digestion. Bloch also referred to work previously done by him in which these cells were always found to be normal under a variety of pathologic conditions involving the intestines. He also referred to Paneth's experimental work on animals in which these cells presented no abnormal appearances even after prolonged starvation. Whether or not the condition of Paneth's cells in these cases actually causes the atrophy, he at least feels sure that the condition of these cells is a primary one and is not induced by the atrophy.

Bloch, in describing the liver changes, says that in no case did he find any inflammatory or cirrhotic changes. The acini were distinct and the bile ducts were normal. In two cases the liver cells were normal. In one case, the protoplasmic outlines were not distinct and many of the cells were filled with fat, but the nuclei stained well. Bloch mentioned that Gaston,[8] Lesné[9] and Merklen, and Terrien[10] found severe and extensive lesions of the liver in cases of infantile atrophy. These observations have not been confirmed by other men.

On the whole, therefore, it may be said that there is no convincing evidence of any constant gross or histologic changes in the intestines or liver in infantile atrophy beyond the possible absence of Paneth's granules.

The strongest argument against this theory of intestinal atrophy is furnished by clinical experience. It has been shown many times that when these infants receive a *suitable food* a progressive increase in weight occurs within a few days. Their increase in weight equals or exceeds that of the average normal infant. In atrophic cases, an average gain of seven or more ounces in a week is to be expected until such time as the infant reaches a weight that approximates the normal for its age. It is inconceivable that repair of a serious structural lesion can occur so rapidly or so completely. The only satisfactory explanation for the rapid recovery which occurs when suitable food is procured is that the condition is caused by impaired cell functions and that these functions can be rapidly restored. The nature and situation of the impaired functions have not been determined.

Rubner[11] believes that the condition is caused by impaired intestinal absorption, and states that his experiments furnished no evidence that the metabolic processes were abnormal. It would be more accurate if Rubner said that the absorptive power for cow's milk was impaired, because it has not been shown that there is any impairment of absorption when a suitable food is given.

It is quite possible that there is an intimate connection between the abnormal condition of Paneth's cells and the lessened powers of absorption. Pawlow has shown that the *succus entericus* contains a ferment which he calls enterokinase. He describes it as a "ferment of other ferments," because it acts especially on the proteolytic ferment of the pancreas and increases the latter's activity in a marked degree when certain foods are given. The activity of the amylolytic and fat-splitting ferments of the pancreas is also increased, but to a lesser degree.

These facts, taken in conjunction with the results furnished by a limited number of metabolism observations which invariably have shown diminished intestinal absorption, make it very probable that the impaired intestinal functions are of chief importance in the production of the atrophic condition of the infant.

The assumption that chronic intoxication caused infantile atrophy seemed at one time to offer a plausible explanation of the disease, but up to the present time neither the source, nor the nature, nor the actual occurrence of such an intoxication have been satisfactorily demonstrated.

In 1896, Thiemich[12] published the pathologic findings in the liver in thirty-two cases of gastroenteritis. He did not describe the cases clinically, except to say that they presented manifold appearances. He divided the cases into three classes, depending on the degree of fatty changes present. He believed the fatty changes to be due to a toxin, the source of which could not be determined histologically. Thiemich stated that he did not doubt that such changes as he found must affect the functions of the liver and hoped that the investigations which were being conducted under Czerny's direction would show a connection between the impaired liver functions and cases of infantile atrophy occurring after gastroenteritis.

In 1897 Czerny[13] stated his belief that an excess of cow's milk proteid in the diet of young infants might produce an acid intoxication. He stated that, during the process of hydrolytic decomposition of the cow's milk proteids, an excessive production of acid took place. This necessitated the withdrawal of alkalies from the tissues in order to neutralize the excess of acid, and in this way the liver functions became impaired. In support of this, he referred to the symptoms of intoxication produced in atrophic infants by quantities of cow's milk proteid, which in normal infants produced no symptoms. When the milk proteids were diminished in these cases, the symptoms subsided, but, as the food then contained too little proteid for the body needs, the infant was forced to use up its own tissues. He compared the symptoms thus produced with those which followed the operation of Eck's fistula in dogs, by means of which the portal blood is carried across into the inferior vena cava, and so does not pass through the liver. In such cases, when the dog's diet contains an excess of proteid, severe intoxication symptoms follow, and when the quantity of proteid is reduced the animals emaciate. He believed that in the cases of infants an excess of proteid, together with impaired liver functions, explained the source of intoxication.

This article of Czerny's was the first in a series of six publications which appeared from time to time in the *Jahrbüch für Kinderheilkunde* under the general title *"Zur Kenntniss der Gastroenteritis im Säuglingsalter."* Czerny's article was the first of a series, with the subtitle "Intoxication." This theory of acid intoxication and impaired liver functions furnished the basis for the above-mentioned investigations, which were carried out by men connected with Czerny's clinic. Their results appeared to corroborate Czerny's views. The second paper was written by Keller and appeared under the sub-

8. Gaston: (cited by Bloch) Thesè Paris. Du Foie infectieux, 1893.

9. (cited by Bloch) Etude des Alterations et functions du foie, etc. Rev. des Maladies, de l'Enfance, vol. xix, 1901.

10. (cited by Bloch) "Altérations hépatique de la gastro-enteritis der Nourrise." Rev. des Maladies de l'Enfance, vol xviii, 1900.

11. M. Rubner und O. Heubner: Die natürlichen Ernährung eines Säuglings, Zeits. f. Biologie, vol. xxxvi, 1898. Die Künstliche Ernährung eines normal. u. eines Atrophischen Säuglings, Zeits. f. Biologie, vol. xxxviii, 1899.

12. Ueber Leberdegeneration bei Gastroenteritis. Ziegler's Beiträge z. Path. Anat., vol. xviii 1900.

13. Czerny: Zur Kenntniss der Gastro Enteritis im Säuglingsalter (I. Intoxication). Jahr. f. Kinderheilkunde, vol. xliv, 1897. (IV. Respirationsstörungen) Jahr. f. Kinderheilk., vol. xiv, 1897.

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title *"Ammoniak auscheidung."*[14] Keller found that the quantity of nitrogen excreted in the urine in the form of ammonia was enormously increased in cases of chronic gastroenteritis. He claimed that this showed either that there was more acid in the body fluids than could be neutralized by the fixed alkalies, and, therefore, the ammonia, instead of being converted into urea, was used to neutralize these acids; or else that the urea-forming functions of the liver were impaired. To test this, he administered large amounts of sodium bicarbonate to two patients. He proposed in this way to neutralize any excess of acid present in the body fluids, and if the liver functions were unimpaired he expected to find a diminution of ammonia and a corresponding increase of urea in the urine. He concluded from his results that a condition of acid intoxication was present in these cases.

The third paper in the series alluded to was that of Van den Bergh,[15] entitled, *"Einfluss von Alkalizufuhr auf die Ammoniakauscheidung."* Van den Bergh's investigations were based on the Schroeder-Munzer theory that if an excessive excretion of ammonia in the urine disappeared after the administration of large quantities of sodium bicarbonate it proved that the condition was due to acid intoxication and not to insufficiency of the urea-forming functions of the liver, because the alkaline bicarbonate of soda would not influence liver functions, but would neutralize acid if present.

Van den Bergh gave from two to five grams of bicarbonate of soda in one day to each of five infants with chronic gastroenteritis. Both the total quantity of nitrogen and the quantity of nitrogen in the form of ammonia were determined for several days preceding and following the administration of the soda. The bicarbonate of soda caused either a complete disappearance or a marked diminution in the renal ammonia. This was accepted by Van den Bergh as evidence of an acid intoxication. He omitted to estimate urea in these cases and, therefore, was unable to show that the diminution of ammonia caused a corresponding increase in urea.

The fourth paper of the series, written by Czerny, was entitled *"Respirations störungen."* In this paper Czerny called attention to a type of respiration which occurred just before death in cases of chronic gastroenteritis, and stated that it strongly resembled the type of respiration observed in animals in which an acid intoxication had been produced experimentally.

The fifth paper was written by Czerny and Keller[16] and appeared under the subtitle *"Säurebildung."* A series of experiments were made to determine the effect of variations in the diet on the production of acid within the body in cases of chronic gastroenteritis. In this, as in all their previous observations, they regarded the urinary ammonia as a measure of acid intoxication. They found that changes in the proteid and sugar content of the food produced but little effect on the excretion of urinary ammonia. Changes in the fat content, on the other hand, produced marked effects. A high percentage of fat in the food caused a marked increase in the amount of urinary ammonia. It should be stated that the percentage of fat in the food in these experiments exceeded considerably the quantity usually given to normal infants, namely, from 5.7 per cent. to 8.6 per cent. of fat. These results caused them to modify their views concerning the sources of the acid intoxication, but they continued to believe that pathologic amounts of acid were present in the body fluids of these infants. Their modified belief was that the excessive production of acid was due, in part, to the fat in the food and, in part, to the condition of the infant; i. e., the effect on the infant's metabolism produced by variations in the severity of the gastroenteritis.

The sixth and last paper in the series was by Keller and appeared under the subtitle *"Einfluss der Zufuhr von Ammoniaksalzen auf die Harnstoff auscheidung."* The purpose of this work was to determine whether or not the urea-forming function of the liver was impaired in cases of chronic gastroenteritis. Thus far, in this series of experiments, the liver functions had not been investigated. Keller administered ammonium carbonate to six infants with chronic gastroenteritis. He assumed that if the urea-forming functions of the liver were unimpaired, the carbonate of ammonia would be converted into urea and excreted in the urine. He found a marked increase in the total nitrogen and urea on the day that ammonium carbonate was given, which showed that the ammonia was absorbed. In two cases, the ammonia in the urine was lessened rather than increased, and in one case was slightly increased. Keller attached no importance to this, but concluded that the urea-forming function was unimpaired in these cases. These results were regarded as confirmatory evidence of the correctness of Czerny's theory of acid intoxication.

This work of Czerny and his associates was severely criticized by Pfaundler[17] about three years later. Pfaundler showed conclusively that some of the chemical methods employed were faulty; that many of the results were incorrectly interpreted, and that the collective results of the investigation neither proved nor disproved the presence of an acid intoxication in cases of chronic gastroenteritis. It is now known that abnormal acids (oxybutyric, diacetic, acetone) are present in the urine in cases of acid intoxication. These acids have not been found in the urine from cases of chronic gastroenteritis. In addition to this, much of the work of Czerny and his associates was based on the generally accepted theory of Hallervorden, that an excess of ammonia in the urine is always an indication of excessive acid production in the organism. Hallervorden believed that the injurious action of the acid on the tissues was averted by a combination of the acid with ammonia at the expense of the urea formation, and the excess of ammonia in the urine was regarded as a measure of the degree of acid intoxication present. This theory has been disproved.

Pfaundler denied that the type of respiration described by Czerny was characteristic of cases of acid intoxication, and said that the type of respiration described was not even peculiar to chronic gastroenteritis. He referred to the work of Van den Bergh as the weakest of Czerny's arguments in favor of acid intoxication and showed that Schroeder and Munzer's theory, on which Van den Bergh's work was based, was incorrect. It was assumed that the administration of large amounts of alkali had no effect other than to neutralize acid that might be present in the body, and in this way diminish the ammonia and increase correspondingly the urea in the urine. In three of Van den Bergh's five cases the total nitrogen in the urine was markedly diminished. It has been shown that excessive amounts of alkalies diminish the nitrogen excretion in the urine. A satisfactory explanation for this could not be given at the time Van den Bergh did his work.

14. Jahr. f. Kin. Verh., vol. xliv, 1897.
15. Jahrb. f. Kinderheilk, vol xlv, 1897.
16. Czerny und A. Keller: (V, Säurebildung), Jahr. f. Kinderheilk., vol. xlv, 1897.
17. M. Pfaundler: Ueber Stoffwechsel Störungen bei Magendarm-Kranken Säuglingen. Jahrb. f. Kinderheilk., vol. liv, 1901.

Pfaundler also pointed out that the diminution of ammonia in the urine corresponded to the degree of alkalinity of the urine caused by the bicarbonate of soda and explained why the estimation of ammonia in alkaline urine by Schlösing's method is inaccurate. Referring to the incorrectness of the Schroeder-Munzer theory, Pfaundler said that when fixed alkalies are administered they combine with the acid constituents of the urine and form secondary and tertiary phosphates. When ammonia gas or a solution of ammonia is added to a solution containing tertiary alkaline phosphates, no chemical reaction takes place. The chemical affinities are already satisfied, and the ammonia remains uncombined in the solution and escapes into the air in a short time. In solutions containing secondary alkaline phosphates the conditions are more favorable for the ammonia to combine. A urine that contains only secondary and tertiary alkaline phosphates, and from the presence of these reacts alkaline, can not combine to form a stable compound with ammonia.

Pfaundler thinks that the nitrogen may escape through the skin and lungs in such a case. He referred to Keller's experiment, in which he administered ammonium carbonate to test the urea-forming function of the liver, and shows that the results were not conclusive. A portion of the ammonia administered was not accounted for in the urine, and the quantity of ammonia in the feces was not determined, so there was no data to show what the absorptive power of the intestines was for ammonia, and no control observations were made on normal cases. It is not permissible to assume that the administration of an injurious substance like ammonia would produce no alterations in the metabolism.

Pfaundler referred to another source of urea which was not considered by Keller, namely, amido acids present in the diet (malz suppe) of these infants. The formation of urea from amido acids is not a function of the liver, so that other organs besides the liver must have taken part in the urea formation in these cases. In three of the observations, the increase in urea exceeded the increase in total nitrogen after giving the ammonia, showing that there was some other source for part of the urea than that of the liver alone. Pfaundler further stated that the method which was used to determine urea is not an accurate one when large quantities of amido acid and derivatives are present. He concluded that these results failed to prove that the urea-forming function of the liver was intact in such cases. He then criticized the investigations of Keller, in which he determined the quantity of ammonia in the urine in cases of chronic gastroenteritis and found Keller's figures much too high. This he attributed, in part, to the formation of ammonia in the urine on standing, and, in part, to the effect of the diet. He called attention to the extraordinary fluctuation in ammonia excretion in the course of from twenty-four to forty-eight hours without any evident explanation and with no change in symptoms. In this connection he referred to an observation made by Bendix that if the renal ammonia is a measure of acid intoxication, then very large amounts of ammonia should indicate severe cases of intoxication. Neither Bendix nor Pfaundler could detect differences in the general condition of these infants which corresponded to the amount of urinary ammonia. It was admitted by Czerny and Keller that the diet was of importance in this respect.

In addition to his criticism of these investigations, Pfaundler controlled the results, to some extent, by very carefully conducted observations on forty infants and children. These included infants whose digestions were normal and infants with chronic gastroenteritis. Some of these infants were breast-fed. He found that the urinary ammonia in the first half-year of life was much higher than at other ages. On the average, both normal and abnormal digestions were 15.88 per cent. These results were obtained in perfectly fresh specimens of urine.

With digestion normal.....	15.00 per cent.
With digestion abnormal.....	16.30 per cent.
A good general condition.....	13.77 per cent.
A bad general condition.....	17.10 per cent.

In a small number of cases examined in the second half-year the average was 6.28 per cent. He found little variation in the amount of urinary ammonia from day to day when the diet remained the same. Increase in the fat when artificial food was given increased the ammonia to some extent. He did not give such high percentages of fat as Keller. (Such high percentages of fat would not be tolerated for long periods by healthy infants.) Pfaundler could detect very little difference in the ammonia excretion between infants with normal and those with abnormal digestion, following alterations in the percentage of fat in the food. He showed that a physiologic hyperacidity is present in the tissues of artificially fed infants whose food contains an excessive quantity of fat. This is the condition described by Naunyn as acidosis and is not to be confounded with acid intoxication, which is necessarily an injurious condition.

Pfaundler estimated the amount of urea and amido acids and found that in the first half-year the average percentage of urea nitrogen to the total nitrogen was 55.94 per cent. in infants with normal digestion and 47.08 per cent. in infants with digestive disturbances. These figures are lower than those usually given for this age. In the second half-year, the average percentage of urea nitrogen to total nitrogen was 76.53 per cent. He found in the first half-year an average of 12.01 per cent. of the total nitrogen represented by oxyproteic acid, amido acids and, perhaps, other substances. This is much more than occurs in adult urine. The urine content of urea showed an alternating relationship between the urea, the ammonia and the amido group. In conclusion, Pfaundler referred to the work of Jacoby and others on oxidative ferments of the liver and gave his own results obtained from the examination of seventeen livers. In nine cases in which the livers appeared to be normal histologically, he found the average oxidative power to be about three times as much as that of eight cases in which the livers showed evidences of severe parenchymatous or fatty changes. He remarked that this was the more surprising, because in the cases of adults and of animals marked parenchymatous changes in the liver do not cause such impairment of function that it can be detected by metabolic investigation. He suggested the possibility that in adults there is greater reserve power or that other organs may act vicariously. In twelve of these cases, he had examined the urine during life and found that ten of them showed an alternating relationship between the quantity of urinary ammonia and the oxidative power of the liver. When the amount of urinary ammonia was above the average, the oxidative power of the liver was less than the average and *vice versa*. He admitted that these results required verification, but believed that if they could be substantiated they would have an important bearing on the nitrogen distribution in the urine and might throw light on many obscure metabolic disturbances.

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Pfaundler gave the following summary: 1. The ammonia coefficient (percentage of ammonia nitrogen to total nitrogen in the urine) is decidedly higher in the urines of both normal and abnormal infants than in the urine of adults, but not so high as Keller found nor are the variations so extreme.

2. This relative increase in renal ammonia is dependent, in part, on the high fat content of the food and, perhaps, in part, on a deficient oxidative function of the liver and tissues.

3. Ammonia coefficient above the normal occurs (a) when the liver cells are diseased (extreme fatty changes;); (b) when, for any reason, the general condition is much impaired, accompanied by circulatory and respiratory disturbances. Such a condition is frequently observed before death and is not more commonly associated with digestive disturbances than with other severe disorders; (c) when artificial food contains much fat.

4. The importance of this increased ammonia excretion depends on the cause. In a and b the increase of ammonia occurs because the oxidative synthesis to urea is interfered with. In one case the liver functions are impaired; in the other case oxygen is not supplied in sufficient quantities to the tissues or else is not taken up by them. In c the ammonia accompanies acid metabolic products which prevent its synthesis to urea and this constitutes so-called alimentary acidosis.

5. The hypothesis of Czerny and Keller that chronic gastrointestinal disease in infancy causes an acid intoxication, which in turn injures the metabolic functions and is shown by increased excretion of ammonia in the urine, can not be admitted. Insofar as the increased excretion of urinary ammonia in Keller's experiments was due to relatively large quantities of fat in the food, it constitutes an acidosis, i. e., an increased acidulation of the body fluids, and is not an acid intoxication. This condition can occur in a normal organism under the same circumstances and therefore has nothing to do with the gastrointestinal disease. It can not be proved to cause injury to the organism.

In cases in which the increased excretion of ammonia is not due to large amounts of fat or to faulty composition of the food, it has the appearance of a primary retention of ammonia in the organism, therefore the opposite of an acid intoxication. This may be due to relative or to absolute insufficiency of the oxidative functions of the organism. In one case more ammonia might be produced than the liver and the urea-forming organs could oxidize, and in the other case parenchymatous changes in the liver might impair its urea-forming function.

From the evidence thus presented, it is safe to assume that infantile atrophy is caused by functional impairment. It can not be stated definitely which functions are impaired. All metabolism investigations in cases of infantile atrophy have shown a diminished power of intestinal absorption for cow's milk and for other artificial foods. The impairment of function in this case may have to do with the digestion or with the absorption of the food. I know of no metabolism investigations which show the absorptive powers of atrophic infants for breast milk. It has been demonstrated clinically many times that these infants gain in weight and in every other way with astonishing rapidity when they are fed on breast milk. It is quite possible that they may not absorb the breast milk at first any better than other food, but the organs work more economically and more benefit is derived from the quantity absorbed. Rubner's[17] metabolism observation on a normal breast-fed infant showed that the infant did not absorb well during the observation, at least so far as nitrogen was concerned, and in addition received much less milk than usual. Notwithstanding this, it did not lose in weight. The re-establishment of functions within a few days that may have been seriously impaired for months suggests something besides the mere question of digestibility of food. It is possible that human milk contains ferments that stimulate directly the functions of the digestive glands. Pawlow[18] and his associates have shown that the mechanism of digestion is much more complicated and sensitive than was supposed and that there is great variation in the quantity and quality of the digestive juices dependent on the character of the food. May it not be that the digestive glands of young infants, aside from individual variations, are less adaptable than those of older infants? The gland cells function best when stimulated by human milk. In most young infants the digestive glands can be made to adapt themselves to abnormal conditions insofar as to digest cow's milk or other artificial foods when these foods are carefully adjusted to suit the infant. These same foods when not properly adjusted cause digestive disturbances which, if long continued or of frequent occurrence, result in infantile atrophy. It is not improbable that human milk contains special ferments that stimulate the activity of the digestive glands and that when other foods are given the stimulation is less effective and easily produces a condition of abnormal digestion.

EFFECTS OF DIFFERENT FOODS ON THE ATROPHIC CONDITION.

It will be of practical value to consider the effects of different foods on this condition. It will suffice for purposes of comparison to divide the methods of feeding into three classes, viz., proprietary foods, cow's-milk mixtures, human breast milk.

Proprietary Foods.—Very little need be said about the value of proprietary foods in cases of atrophy. It is not necessary to consider their composition for purposes of comparison. All that is required in this connection is to decide whether any or all of them provide a suitable food for atrophic infants. Their usefulness in this respect can be estimated by the results obtained from their employment. In a majority of cases they prove to be unsuitable. It can not be denied that some cases of atrophy gain rapidly in weight and, to all appearances, thrive on these foods. These good results, however, are of little assistance to the physician as guides to the treatment in similar cases because they appear to follow no definite rule and subsequent attempts with the same food usually result in failure. The physician should be governed in the choice of the infant's food by the requirements of the case. A hit or miss method of feeding does not educate the physician and it is oftentimes disastrous for the patient. Almost every case of infantile atrophy that is brought to the specialist for treatment gives the history of the use of several proprietary foods. In many cases a temporary improvement follows the use of each one. The improvement is usually of short duration and then another food is tried. These histories furnish a commentary on this method of feeding.

It should be remembered that other disturbances of

18. J. P. Pawlow: The Work of the Digestive Glands. Translated by W. H. Thompson, London, 1902.

nutrition, for example rickets and scurvy, may occur after a prolonged use of these foods.

Cow's-Milk Mixtures.—The metabolism observations of Rubner[1] have shown that in order to utilize cow's milk an infant expends much more energy than is the case when breast milk is used. In the observations referred to the excess of energy required for the utilization of cow's milk was shown by a marked increase in the excretion of carbon dioxid and of water. There is comparatively little loss of energy due to muscular activity in young infants, and so this excessive loss is attributed to increased activity of the digestive functions. Rubner states that he believes the entire metabolism is affected in this case and not intestinal absorption alone. Rubner's metabolism investigation of a case of infantile atrophy showed that the infant was not able to digest and to absorb such large quantities of food as a normal infant. The food in this case was a modification of cow's milk with milk sugar. All the metabolism observations that have been made on atrophic infants in which some modification of cow's milk was used have shown a greatly diminished power of absorption for fats and proteids. Heubner[2] says that an atrophic infant requires more calories in its food per kilo weight than a normal infant in order to balance the extra energy lost in the intestines and absorbents during digestion. These observations coincide perfectly with the results obtained by clinical experience. It is generally considered that cases of infantile atrophy digest and gain better on cow's-milk mixtures when the percentages of fat and of proteid are low. This deficiency must be made up to some extent by increasing the carbohydrates; otherwise there is great danger that the mixture will contain too little nourishment for the infant's needs.

The fact that these infants absorb carbohydrates much better than they do fats and proteids probably explains the rapid improvement that sometimes follows the use of condensed milk and proprietary foods. In these preparations there is always a large proportion of carbohydrate material, and when milk is mixed with them it is usually so much diluted that the percentage of fat and proteid is low. By the addition of whey to milk mixtures a larger proportion of lact-albumin, compared to casein, can be obtained. This is desirable in some cases, but in my opinion most of the cases of atrophy that do badly on a cow's-milk mixture which contains a low percentage of proteid and of fat will do the same on a whey mixture. It has been shown that a relatively small quantity of proteid is required to repair tissue waste, so long as this small quantity is protected by a sufficient quantity of fat and carbohydrate. Metabolism observations seem to show that these infants possess the power of retaining proteid material to a greater degree even than average infants; and, in spite of the great loss of nitrogen in the feces, they evidently absorb enough to more than balance the tissue waste. The practical application of these facts in the use of cow's milk in infant feeding was long ago pointed out by Heubner. He thought that it was unwise to overburden the digestive organs with an excess of proteid material, and showed that more energy is required to utilize it, and that excessive amounts of it are or may become detrimental. This is especially true in infantile atrophy. Excessive amounts of cow's-milk proteid require more energy for their utilization; they are not well absorbed and resulting disturbances of function may very well interfere with the absorption and assimilation of the other ingredients of the food.

Atrophic infants cry a great deal more than do normal infants, and this is almost invariably accepted as evidence that they require more food. Further proof of supposed hunger is afforded by the fact that they do not gain in weight. The result is that when these patients are brought to the specialist for treatment he finds that they have been taking larger amounts of food at each feeding than an average infant of the same age would take. The digestive and absorptive powers of these infants are so seriously impaired that their tissues can not derive the needed amount of nourishment from the food which is supplied. When an excessive amount of food is given it defeats its purpose by impairing still more the powers of digestion and of assimilation. The results of treatment substantiate this. A majority of the cases of atrophy that recover on cow's-milk mixtures do so on relatively small quantities of a mixture weak in fat and proteid. The interval between each feeding in these cases should be shorter than for a normal infant of the same age, so that the deficiency in quantity each time is made up by an increased number of feedings. It is rarely necessary for such an interval to be less than two hours. By this means the digestive organs are not unnecessarily overtaxed and absorption is assisted. If improvement follows this method of treatment, it is necessary to keep pace with the improvement by changes in the strength or quantity of the food and by alterations of the intervals. This must be done cautiously to avoid upsets, which often follow imprudent changes in such cases.

With all these precautions, a great many cases of infantile atrophy do badly on mixtures of cow's milk. When this method of feeding succeeds the improvement is almost always slow. The progress is rarely constant. It is frequently interrupted by digestive disturbances and by periods during which there is little or no gain in weight. Under these circumstances a gain of three or four ounces each week may be regarded as encouraging. After a certain degree of improvement has occurred the progress is more rapid, but it is usually a question of several months of treatment before this condition is reached. During this time the milk mixtures have to be adjusted and readjusted many times. A limited number of emaciated infants improve at once on cow's-milk mixtures and gain rapidly in weight. Most of these cases are not, properly speaking, cases of infantile atrophy. Infantile atrophy is always associated with impairment of the digestive and absorptive functions. In the emaciated cases just mentioned the infants have been underfed, as a rule, not so much in quantity as that they have received too weak a food. In some cases, when they receive a more suitable mixture or amount of the cow's milk, they absorb it well and gain at once. These cases are cases of partial starvation and are not true cases of infantile atrophy. I have not relied solely on my own experience in making the above statements regarding cow's-milk mixtures, as any one may verify who cares to look over the literature on the subject. In my opinion, the method of feeding cases of infantile atrophy on cow's-milk mixtures is unsatisfactory in a majority of instances. The infants that do improve on cow's-milk mixtures do so because they have ultimately acquired a power to digest and to absorb this food. That is to say, the child is adapted to the food and not the food to the child.

Breast Milk.—The results obtained by feeding infants with infantile atrophy with human-breast milk have been perfectly satisfactory in my experience. The

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improvement in general condition and the gain in weight often begin within a few days, certainly within two weeks, and continue uninterruptedly, so far as they are dependent on digestion, as long as the breast milk is furnished in sufficient quantities. The gain in weight often exceeds that made by the wet nurse's own baby previously. Whatever function or functions have been impaired, they are evidently capable of the most rapid recovery. My experience warrants me in saying that when such an infant does not gain on the average at least an ounce a day, the fault lies with the wet nurse and not with the infant. The point which I wish to bring out clearly is that these atrophic infants are just as able to gain in weight as any normal infant when they receive a suitable food, and that breast milk is the only food that can be uniformly relied on to accomplish this result. It need hardly be emphasized that if a breast milk is of poor quality and insufficient in quantity it is no more suitable than any other poor food.

Naturally, when choosing a wet nurse, one is selected whose baby is doing well. It is not necessary that the age of your patient and the age of the wet nurse's baby should correspond. While taking breast milk, atrophic infants frequently have several more or less watery and undigested movements daily, without any evident bad results. It does not seem to interfere with the gain in weight nor with their general condition. This is peculiar to breast milk. Such dejections, if associated with other methods of feeding, would be followed by bad symptoms. It can not be denied that there are many objections to the use of a wet nurse. The serious ones, which refer to contracting diseases by the infant, can be avoided. The others must be tolerated to some extent. It must be remembered that in these cases the family of the patient are discouraged and worn out with the care of the infant, and when they see almost immediate and marked improvement they quickly become reconciled to inconveniences and are willing to put sentiment aside. Wet nurses can be controlled up to a certain point, and in this connection it is always a fatal mistake to encourage a belief by the wet nurse that she is indispensable. If she is not satisfactory, another can be procured. It is a fallacy to suppose that one woman's milk is any more suitable for a given infant than another woman's, provided both milks are good, that the quantity is sufficient, and that no mechanical hindrance exists in the one case and not in the other. If the wet nurse is made to understand that the place is hers only so long as the baby does well and she is satisfactory, it will make a difference in her behavior. I have rarely found it necessary to try more than two wet nurses in a given case, but now that I feel so certain that good results will follow this method of feeding in cases of atrophy, I should persevere until a suitable wet nurse was found, no matter how many I tried. The difficulty in making infants accustomed to the bottle take the breast is rarely serious. Persistently withholding other food for some hours will overcome their resistance. I have often found it necessary to allow the wet nurse to retain the charge of her own baby. In such cases the wet nurse's baby was fed on a mixture of cow's milk. It can not be denied that one would rather not be burdened with the wet nurse's baby, but, on the other hand, the care of her baby oftentimes reconciles her to the position and helps to occupy her time. The possibility or probability that she will nurse her own baby can be avoided without much trouble.

In my practice, when cases of atrophy are brought to me for treatment, I make it a point to express my views to the parents on the relative values of different foods. They almost always object at first to the employment of a wet nurse. Out of deference to their feeling and because it is always possible that whoever has had charge of the feeding previously has not made use of mixtures appropriate for such cases, I try mixtures of cow's milk for from two to three weeks and note the results. If the improvement is not satisfactory I recommend a wet nurse. I should omit the preliminary trial if the infant's general condition did not warrant it. Thus far I have never had occasion to regret employing a wet nurse. In many cases even a few weeks of the breast milk will produce such improvement in the weight, general condition and digestive powers of the infant that it will be able to adapt itself to cow's-milk mixtures if for any reason it becomes necessary or desirable to change.

THE ELIMINATION OF THE MOSQUITO.*

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I am quite sure that the members of the American Medical Association are familiar with the general literature regarding mosquitoes, and that a detailed account of the different varieties of these insects, their anatomy, method of development and the physiologic reason why they transmit disease is unnecessary. I have chosen, therefore, to present some practical facts which have a direct bearing on the work of exterminating the mosquito.

A decided and very satisfactory change has taken place in the attitude of the public toward this subject during the past three or four years. At first, efforts to exterminate the mosquito in this country were looked on mainly from a humorous point of view, and but little co-operation was extended by the laity. The public, however, has learned that the object of this work is not only to prevent the annoyance which the bite of this insect inflicts, but also to prevent the transmission of the disease, inasmuch as it has been proved that yellow fever is transmitted by the variety of mosquito known as the stegomyia, and malarial fever by the anopheles, and that so far as we know at the present time this is the only means by which these diseases are propagated.

In the extermination of the mosquito, it is imperative that we should be familiar with certain habits or conditions of this insect, otherwise our efforts are not apt to be attended with success. We must know, first of all, that mosquitoes propagate only in water. The importance of this fact is that it gives definite information regarding the situation of breeding places. We know that the eggs deposited on the surface of the water develop into the larvæ, commonly known as the "wigglers," then into the very transient stage of the pupæ, which in appearance may be regarded as a change in the shape of the larvæ, and that these are very soon transformed into the winged insects, and that from the deposit of the eggs to the development of the winged insect only from twelve to twenty-five days elapse. The latter period, as a rule, is required for the development of the anopheles or malarial mosquito. So far as my

* This paper was prepared for the Section on Hygiene and Sanitary Science, but was not read, owing to the absence of the author.

own investigations show, the propagation of the mosquito is, as a rule, most active in stagnant or offensive waters, or in that which contains considerable organic matter. Two instances have recently come under my observation where broken sewer pipes discharged into ground depressions, causing collections of offensive water. In the immediate vicinity of these were pools of water which were not contaminated; i. e., collections of rain water and not of offensive fluid. In both instances it was found that the contaminated water soon became exceedingly rich in mosquito larvæ, whereas in the other pools, within two or three hundred feet distant, which contained comparatively clear water, there were very few, if any, larvæ found.

Experiments made at the New York Quarantine Station have practically corroborated this. In these experiments large superficial wooden tanks were employed, in which different kinds of water were placed; i. e., rain water, hydrant water, water in which decomposed meat and fish had been placed and water containing other offensive material. These tanks were exposed, side by side, in a place infested with mosquitoes. In all the tests, it was shown that the deposit of mosquito eggs was always greater in the tanks containing the offensive water. Experiments on a smaller scale were also made. Exposed pails and glasses containing the different kinds of water already referred to were employed and the same results were noticed, viz., the deposit of eggs was much greater in offensive water. These experiments were repeated many times with the same result and fully confirmed the conditions, which I have found in mosquito-breeding districts. The experiments to which I have just referred were made with the culex, which is the commonest type of mosquito. There is, however, a variety of the culex known as the *Culex solicitans*, the striped-legged, Atlantic coast or salt marsh mosquito, which may be excepted from the above, inasmuch as it breeds in salt water or in salt or brackish marshes. Furthermore, the malarial mosquito, known as the anopheles, while it may be found breeding in offensive water, prefers small pools of water which are not so contaminated and which may be found in excavations containing surface water frequently having a green scum on the surface. I have found the anopheles larvæ in water contained in small ground depressions along the edge of swamps, also in unused receptacles which are found about houses. Occasionally the anopheles larvæ may be found in the same breeding pool with the culex; this, however, is not common. In a general way, it may be said that mosquitoes will breed in almost any receptacle and in the most unusual and unsuspected places, commonly in rain-water barrels, cisterns, cesspools, tin cans and other metal, glass and wooden receptacles, roof leaders, crotches of trees, etc. It is very necessary that physicians should be familiar with this fact.

It is a common belief that mosquitoes will not breed in salt marshes. My experiments show that in captivity the fact that a variety of the culex, known as the *Culex solicitans*, or the Atlantic coast, striped-legged or salt-water mosquito, breeds in salt water or in salt marshes. My experiments show that in captivity the *Culex solicitans* will sometimes deposit their eggs on fresh water contained in glass jars; whether or not they will do this if they are free has not yet been fully decided. It is probable that along the Atlantic coast the salt marshes in many places furnish fully 80 per cent. of the mosquitoes in these sections. Dr. John B. Smith, State Entomologist of New Jersey, who has carefully investigated this variety of mosquito, states that it will deposit its eggs on the soft earth, in salt marshes along the sea coast, and that these eggs will remain intact for months until the swamps overflow and there is sufficient water to develop them into larvæ and subsequently into the winged insects. My experiments have partially confirmed this. I have confined the Atlantic coast or striped-legged mosquitoes in glass jars, in which was placed soft earth taken from salt marshes along the coast, and it was soon found that the eggs were deposited on this material. When salt water was added to this, after the eggs had been laid a number of days, the larvæ very promptly appeared. No proof, however, has ever been produced to show that the larvæ can be developed from these eggs without the presence of water. If the *Culex solicitans* be confined in water to which various amounts of salt have been added or in jars containing sea water, a deposit of eggs on the surface will soon be noticed; however, I have been unable to secure this result with any but the Atlantic coast mosquito.

A general impression exists that the life of the mosquito is very short, probably a few days only. While it is true that the mosquito is not a resistant insect and easily succumbs to all sorts of influences, it is a fact that it lives indefinitely. In the hibernating stage it is known that it may live from the fall to the following spring, and during the warm weather, or in its active stage, it may live a number of weeks. It is practically impossible to arrive at any definite conclusion regarding the life cycle of the mosquito, inasmuch as experiments do not furnish satisfactory evidence, for the reason that they can not be carried out under the same conditions that naturally exist. In other words, mosquitoes may die from captivity alone, or when they are unable to select the character of food which they require. It is safe to assume, however, that if they will live a certain period in captivity, they will live equally long when they are free to go and come as they please. There have been many investigations made and published on this point, and experiments have shown that in captivity mosquitoes will live for a number of weeks. I have kept them in wire cages containing nothing but sugar water for almost two months; furthermore, mosquitoes may be kept for a long period in captivity without food or water, provided sufficient air be present. Aside from the interest in securing definite knowledge in this direction, the length of time which mosquitoes may live in captivity has an important practical bearing, as it has been claimed that yellow fever may be transmitted from one place to another through the agency of the stegomyia, or yellow fever mosquito, confined in baggage, etc. In order to secure so far as possible definite information regarding this part of the subject, I carried out the following experiments: A number of boxes which could be compared to trunks, also canvas bags, such as sailors use to contain their clothing, and other receptacles were filled with clothing, blankets, bedding, etc. Mosquitoes were collected from a horse stationed in a thickly infested mosquito district. This was done by placing glass test tubes over the mosquitoes. When a sufficient number were secured the openings of the tubes were filled with light cotton plugs. The tubes were then introduced into the receptacles already described, the cotton plugs removed and the tubes gradually withdrawn and shaken sufficiently to drive out the mosquitoes. This method was

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employed in order to prevent any possible injury to the insect. In each experiment a record was kept of the number of mosquitoes in the different receptacles, and, although many experiments were made, it was found that in no instance did the mosquitoes in any receptacle live longer than thirty hours. I believe, therefore, that the treatment of baggage coming from yellow fever ports is unnecessary, provided the period of transit exceeds two days.

Considerable discussion has taken place among those who have investigated the mosquito regarding the origin of the first crop of these insects, which appear in the spring or summer of each year. As I have already stated, Dr. John B. Smith claims that the egg of the *Culex solicitans*, or striped-legged or Atlantic coast mosquito may be deposited on the moist earth, in brackish or salt-water swamps, and that in this situation, he believes, they will remain dormant or hibernate until the following spring, when an overflow of water takes place and the eggs become active and are developed into larvæ and subsequently into the winged insects. It has also been shown that larvæ will hibernate and that during the winter they may be found in ice and after being thawed out become active. The latter phenomenon has come under my notice, but I have seen no instance in which larvæ after being frozen and thawed out have developed into winged insects. This may occur, but I am sure that it is uncommon. Although the eggs of the *Culex solicitans*, Atlantic coast or striped-legged mosquitoes, may hibernate during the winter, and be the origin of the first crop of this variety of the mosquito in the spring or summer, I am satisfied from my own experiments that the first crop of mosquitoes which come to us each year, particularly in inland towns, or about fresh water supplies, is due to the hibernation of the winged insect. It is common experience with all who live in mosquito-infested districts frequently to find these insects in midwinter, particularly in overheated rooms, etc. It is evident that when the cold weather approaches the mosquito instinctively seeks some protected place, such as crevices in the interior of tree stumps, cellars, barns, interior of houses, etc., and, while there are probably but comparatively few which do not succumb to the cold weather, sufficient survive to perpetuate the species during the following year.

Another very much disputed point regarding the mosquito is whether or not they go far from their breeding places. While there is indisputable evidence that mosquitoes at times are found far from home, there is also the best evidence that they do not go willingly. One of the most satisfactory instances that I know of, which proves that they are found some distance from their breeding place is that furnished by the New York harbor pilots, whose boats are frequently anchored along the Jersey coast, three or four miles from land—occasionally they become suddenly infested with mosquitoes. The pilots are unanimous in their statement that when this occurs there is always a breeze from the shore. While indisputable evidence has been presented to show that mosquitoes go far from home on land, as well as at sea, there is good reason to believe that this does not commonly occur. It is the opinion of all who have carefully studied this insect that they do not willingly go far away, and I believe that we are justified in assuming that if a section of country be infested with mosquitoes a breeding place exists in the immediate vicinity. I speak emphatically in this matter, as many times after it has been positively stated that mosquitoes must have come a long distance, it has been found that breeding places existed in the neighborhood, and there is no doubt that the difference of opinion which existed on this subject is largely due to the fact that local breeding places are frequently overlooked. When it is remembered that the female mosquito will lay three or four hundred eggs at one time, and that it only requires from twelve to twenty-five days for these eggs to develop into the full-grown winged insect, it will be better understood how a small receptacle will breed a large number of mosquitoes. Therefore, before hunting for the breeding places of mosquitoes at some distance from home, we should first examine every detail of our own premises to ascertain if receptacles for the propagation of this insect can not be found.

These breeding places are often discovered in the most unsuspected locations. In connection with this and as an item of interest, I will refer to an investigation made two or three years ago. My attention was called to a number of cases of malarial fever occurring in two or three houses adjoining each other. Anopheles were found in the bedrooms of these patients during the evening. In close proximity to these houses were found numerous pools of water, and, although each one was examined with great care, no anopheles larvæ were found. The most careful inspection was made of every cistern, rain-water barrel, etc., in the neighborhood with the same result. This lent some color to the belief that the mosquito in this instance might have come from a distance. Further investigation was made, however, and in the garden of a house in the rear of those containing the cases of malarial fever, and which had been vacated for some time, was found an old cake pan almost entirely covered by long grass, and in this was found a large number of anopheles larvæ. An ordinary inspection would not have discovered this receptacle.

As a résumé of what we know at the present time, it may be said:

First, mosquitoes do not propagate without water, and, as a rule, so far as the culex is concerned, the more offensive the water, the greater the propagation. Although the anopheles or malarial mosquito will propagate in offensive water, sewerage, etc., they are more apt to be found in small collections of water, about fresh water swamps or in small receptacles about the house. In large ponds or pools of fresh water, particularly those which contain small fish, which prey on the larvæ, mosquitoes of any variety are not usually propagated, but the little pockets of water along the edges of these ponds or in other places frequently act as breeding places. We also know that a variety of mosquito known as the *Culex solicitans*, or the striped-legged, Atlantic coast or salt marsh mosquito, breeds in salt water or in salt marshes. Mosquitoes breed in cisterns, rain-water barrels and cesspools in enormous number; other receptacles about the premises, no matter how small or where they are situated, may also act as breeding places. It is about our own homes, therefore, that the examination should first be made to ascertain where the propagation of this insect is carried on.

Second, the life of the mosquito is not confined to a few days, but under various circumstances may extend over a period of weeks or months.

Third, the first crop of mosquitoes which appears in the early summer of each year, particularly in inland towns, is principally due to the deposit of eggs which

have hibernated during the winter months. These, of course, are comparatively few in number, but are sufficient for the purpose above referred to. The variety of the mosquito known as the *Culex solicitans* is probably largely perpetuated by the hibernation of eggs, which are deposited in the soft earth, in salt marshes along the sea coast, and remain dormant during the winter; when the warm weather returns and the marshes are overflowed with water, these eggs become active and develop into larvæ; subsequently into winged insects.

Fourth, although there is conclusive evidence that mosquitoes are sometimes carried long distances from home, they do not willingly go far from their breeding places, and it may be assumed that if a section is infected with mosquitoes breeding places exist in the immediate vicinity. It is probable that an exception may be made in the case of the *Culex solicitans*, or salt-water mosquito, which appear to go further from home than other varieties of the culex or the anopheles. There is good reason to believe, however, that they do not breed away from the salt marshes or in collections of fresh water.

Efforts to prevent the propagation of the mosquito consist in abolishing or removing receptacles which contain water. This applies to both large and small ground depressions, swamps, etc., and to portable and stationary receptacles about buildings. The scientific, practical and radical method of removing water in ground depressions is by drainage or filling in, and the use of petroleum oil in these instances can not be regarded as a substitute for this purpose and should only be used as a temporary measure. In mosquito-infested districts our first action should be to remove, so far as possible, from dwelling houses and other buildings, all sorts of metal, glass and wooden receptacles for water. Cisterns and rain-water barrels should be supplied with tight-fitting covers; by having the center of these covers constructed of wire netting sufficient air is admitted. Roof leaders should be kept properly graded; otherwise parts of them may act as breeding places for the mosquito. If ground depressions either about the premises or in the neighborhood can not be drained or filled in, petroleum oil may be used as a temporary measure. The crude petroleum is probably superior to the refined oil and should be used in the proportion of one pint of oil to a water surface of about twenty feet in diameter —even a less amount of oil may be effective. This procedure should be repeated every two weeks. The method by which the oil destroys the larvæ or wigglers is probably not by a toxic effect, but by a mechanical one. The larvæ must come to the surface of the water for air at least every two minutes. If watched carefully it will be seen that the culex, or common variety, approach the surface of the water at right angles, with the tail uppermost, the air being taken in at this end, which is extended sufficiently above the surface. The anopheles larvæ may be distinguished from the culex at this stage, inasmuch as they do not lie at right angles to the surface of the water, but parallel to it, and receive the air by projecting the head above the water instead of the tail. It is probable that the oil thrown over the surface plugs up the delicate respiratory apparatus of the larvæ and practically suffocates them. This is largely corroborated by experiments. If a small amount of petroleum oil is thrown over the surface of the water in a glass jar containing larvæ, the latter will succumb in from ten to twenty minutes; toxic agents do not kill them with such rapidity, as careful investigation has proved. The odor of petroleum oil is either very unpleasant or injurious to the winged insect. It has frequently been noticed when petroleum has been used in swamps in large quantities that the number of mosquitoes abruptly diminishes.

In treating large bodies of water with petroleum, the ordinary garden sprinkling pot is a good and practical method of distributing it. Experiments made with permanganate of potassium, bichlorid of mercury, sulphate of copper, carbolic acid, etc., have shown that these agents are greatly inferior to petroleum for this purpose. Their action is slow, and the mosquito larvæ live in comparatively strong solutions. For instance, larvæ have remained active from one to three days in a 1/1500 solution of bichlorid of mercury. Even comparatively strong solutions of carbolic acid or permanganate of potassium do not destroy them for some time. In some very exhaustive experiments made with sulphate of copper and lime for the destruction of mosquito larvæ,[1] I found that these agents did not destroy the mosquito by a toxic effect, but slowly by clarifying the water and precipitating the organic matter which it contained, thereby removing the nourishment from the larvæ. Furthermore, it must be remembered that pools of water throughout the country may be used for drinking purposes, particularly by animals, and that the use of such agents as bichlorid of mercury, carbolic acid, etc., are, therefore, unsafe. On the other hand, the petroleum oil is cheap, practically harmless and destroys the larvæ at once, and so far as we know at the present time is superior to anything else for this purpose, provided proper drainage or filling in can not be effected.

All varieties of mosquitoes are most active after sundown. This we know not only from the annoyance which they cause us, but from the indisputable testimony presented by medical experiments with the malarial and yellow fever variety. During the day, when the mosquitoes are generally inactive, they select for their abiding place the high grass and underbrush. Therefore, this material should be removed if present about the premises in mosquito-infected districts.

The points to which I have referred in this paper constitute the bulk of what is at present really known regarding the habits of the mosquito and the means of exterminating them. Many investigations, however, are now in progress in this country, and there is good reason to believe that much valuable information will be added to our knowledge during the next year.

ANKYLOSTOMIASIS OR UNCINARIASIS.*

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GRENADA, BRITISH WEST INDIES.

This disease, an endemic anemia caused by the parasite. *Ankylostoma duodenale* or *Uncinaria duodenalis* and *Uncinaria americana* (Stiles), is a dangerous one both to the individual and to the community in general, leading as it does in individual cases to degeneration of important organs, resulting probably in death and to widespread infection and deterioration among the community in general.

The parasite is now too well known to need a full description; in Grenada, B. W. I., the large majority of cases show the old world parasite, viz., *A. duodenale*

1. Medical Record, Jan. 21, 1905.

* Read in the Section on Stomatology of the American Medical Association, at the Fifty-sixth Annual Session, July, 1905.

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but in many many cases I have come across the variety described and named by Stiles, *Ankylostoma* or *Uncinaria americana*, the new world variety. The chief differences between these two species lie in the size and the armature of the mouth; the *Ankylostoma duodenale* being larger with a heavily armed mouth, viz., two pairs of hook-like ventral teeth and one pair of dorsal, the *Uncinaria americana* being smaller with 2 pairs of ventral plates or lips and one dorsal pair (Stiles). Microscopically the worms appear as short threads white or gray in color, according to the contents of the genital organs, usually I have found that the white are males and the gray colored ones females with ova; I have only occasionally seen them blood red.

DEVELOPMENT.

The ovum develop in earth under favorable conditions of humidity and temperature and shade. I have found that a certain proportion of water is necessary, in undiluted feces the larvæ appear but soon die; in feces diluted with much water, in a few cases of mine the larvæ appeared; but did not live, but in the majority the ova did not develop. The ova developed at the ordinary temperature in this island, viz., 80 to 90 F., but the larvæ are killed and the ova prevented from developing when placed in ice. Direct exposure to the sun light killed the larvæ when these had developed and also prevented the ova from developing so that a certain amount of shade is required for the development of the larvæ from the ova. Each ovum only produces a single larva and this never takes place within the host but outside so that an increase of adult worms in any particular case is impossible without reinfection from without; this point is therefore of great importance both in the treatment and in the prevention of this disease.

MODES OF INFECTION.

Two methods of infection are possible: 1. By the ingestion of the larvæ in the food or water; 2, by penetration through the skin and subsequent migration to the intestine where the embryos mature into the adult worms.

In Grenada the class found to be chiefly affected with the disease are the laborers and agriculturists, consisting chiefly of negroes, East Indians and poor whites. The huts occupied by them are small, usually raised a few feet off the ground in most cases, entirely surrounded with vegetation almost up to the walls, in this island being chiefly bananas and cocoa and other trees planted to protect the growing cocoa. Sanitation is unknown among them and latrines never used, the feces being deposited on the earth among the trees so that in time the soil, around these huts and also in the fields where they work, becomes heavily infected. During the rains, the mobile larvæ also ova are washed down into the pools, shallow wells and streams and as most of the villages depend on such for their drinking water, it can be readily understood that infection in this manner, viz., by ingestion, can take place; helped to a very great extent by the dirty habits of the people such as eating with soil-stained hands, improperly washed vegetables and fruit and as above stated drinking water infected with the larvæ and containing a large quantity of earthy matter in suspension. I am of opinion that in this island at any rate this method of infection takes place as the drinking water contains to my knowledge both the living larvæ and earthy matter in suspension, so that although many observers have remarked and I have proved to myself that the embryos die on drying and that the earth taken in must be moist yet in the above condition we have both earth and moisture. True geophagy is not practised to any extent in this island, chiefly among children, so that a few cases may be set down as due to this method of infection.

The second method of infection, viz., penetration of the skin by the larvæ, is without any doubt the true one as proved by the experiments of Looss and others. In every case treated by me I have always elicited the fact that the patient has suffered from a form of dermatitis known in this island as "chauffie" or "grounditch" prior to his anemia, the period ranging from 3 months to a year or two, and in advanced cases, they have had attacks every year especially during the rains. I have had 10 cases of this dermatitis under treatment in the hospital and the following were the chief characteristics; in cases of recent infection, scattered vesicles were seen, many of which broke down, leaving small ulcers, usually affecting the lateral side of the feet and the urb of the toes; in older cases the ulceration was more extensive, deep cup shaped ulcers being seen on the dorsum and lateral parts of the foot and between the toes. Some of these cases resisted treatment for some time, although in the early cases they healed quickly. These cases remained under treatment and in about 3 to 6 months from the date of the first appearance of this dermatitis they complained of uneasiness in the epigastrium, in some cases actual pain and other dyspeptic symptoms and on my examining the feces later I found the characteristic ova, thus showing that this dermatitis known here as "chauffie" is caused by the penetration of the skin by these larvæ. This skin infection is wide spread in the island, especially on the estates and among the villages, and nearly every adult laborer has had it and also the children who are allowed to roll about and play in the earth around the huts.

The disease chiefly affects the country and very few cases are seen in the larger towns and this fact is easily explained as follows: No sanitation in the villages, feces deposited on the earth among the bananas and cocoa trees; the ideal temperature, shade, humidity and decaying matter being afforded by these groves for the development of the ova and the poverty and filthy habits of the class as a whole, necessitating walking barefooted, infecting himself and then carrying it to his hut and infecting the children in turn. With regard to immunity from this disease, there is none; all classes may become infected but the poorer classes are more liable not only from the nature of their work, poverty, but also to the inadequate diet both in quality and quantity.

SYMPTOMATOLOGY.

Within the past year, April, 1904, to April, 1905, I have had 215 cases under my treatment and observation at the Colony Hospital, these cases were simply admitted as they applied and a large number also suffered from other complications. I found that uncinariasis could be divided into two distinct classes, (a) acute, and (b) chronic, the acute class being further subdivided into (1) mild cases and (2) moderate. On a microscopic examination of the feces the ova can be readily detected but the number present in the field is no guide to the extent of the infection, in many cases, although if large numbers are seen it is probable there are a large number of parasites but the reverse is not necessarily correct. The mere presence of this parasite

does not constitute the disease and these early cases are only of importance from their being a source of danger to others and to the district or village in which they reside.

Mild Cases.—Pain or uneasiness in the epigastrium often relieved by but usually increased by the ingestion of food. Appetite lost but in many cases ravenous. Frontal headache, dizziness and palpitation, breathlessness on exertion, and indisposition to do any work, either physical or mental. In these cases anemia was not marked and pallor was only slight, being yellowish in whites and muddy in the colored races.

Moderate Cases.—In these cases all the above symptoms were pronounced, pallor is more marked and the anemia prominent. The mucous membranes and conjunctivæ pale, skin dry, appetite in the majority of cases lost, nausea and vomiting present in many cases, pain in the epigastrium. Headache is very severe and continued, referred chiefly to the frontal region, often temporal, vertigo and extreme tinnitus present. Palpitation is severe and breathlessness ensued on the slightest exertion. Great languor and lassitude is complained of, and fever of an irregular, intermittent type is present with pains in the joints.

Chronic or Very Advanced Cases.—Here the anemia is intense and pallor very extreme, the patient having an icteric tinge of the sclera. Edema of the feet and ankles is present with general anasarca in the majority of cases and in 8 cases under treatment ascites was present. The digestive symptoms have changed, either becoming more pronounced, with vomiting on ingestion of food, or in many cases they disappear altogether. Precordial pain and pain in the chest is complained of, palpitation is severe and dyspnea comes on with the slightest exertion, the pulse is weak and compressible and pulsation of the large veins of the neck is noticed. Vertigo and tinnitus is extreme, this latter symptom often causing sleeplessness. Dimness of sight is complained of and in many cases the pupils are noticed to be dilated. The urine is normal in quantity, usually pale in color and in only 3 cases was albumin present. On auscultation bruits are heard over the veins and there is a well marked murmur on the valve areas and the heart itself is often dilated with the apex beat depressed. The muscular system is weak although the muscles appear plump and well nourished and the patient is absolutely incapacitated from any kind of work. The patient is listless and apathetic and the temperature is often raised but in the majority of cases it is subnormal.

Digestive System: Stomatitis.—In two cases only have I seen a stomatitis affecting the tongue and mucous membrane of the mouth and both these cases were in the advanced stages. I do not attach any importance to it as I have not seen it present in other cases. Pyorrhea alveolaris is very common in this island among the laboring class, also caries of the teeth and may be noticed in all the cases of the disease, but I do not see any connection between them.

Tongue.—In the acute and chronic cases, the tongue is very pale, almost white in color, usually coated but often red and raw looking and denuded of epithelium. I have remarked a peculiar pigmentation seen in every case except the poor whites. It consists of a black or blue black pigmentation, in minute spots either singly or in patches usually on the tip and sides of the tongue; it is not seen, as I mention above, in cases in whites but only in the pigmented races, negroes and East Indians; I am of opinion that there is some connection between this pigmentation and the disease but so far I have not been able to establish it. The digestive symptoms are very similar to those due to dyspepsia, and often in the mild cases are simply treated as such, the feces not being examined with the result that the case steadily progresses instead of improving. Appetite is variable, being lost in many cases but ravenous in others; pain or uneasiness in the epigastrium is a well marked symptom and is likened by the patient to the sensation of having a stone in the stomach; this symptom is usually increased by the food taken by the laboring class here which is of poor quality and very coarse and bulky, quantity instead of quality being preferred. Flatulence and palpitation is very common and the bowels are usually constipated, only in the very advanced cases have I seen diarrhea.

Circulatory System.—On inspection, the apex beat is found to be pronounced, especially if the patient is made to walk a little and is usually displaced downward and to the left, but in many of the chronic cases it is feeble. On percussion, the cardiac area is found to be enlarged in the second class of cases and in the chronic cases dilatation is present. On auscultation bruits are heard, very marked in the third left space and in 8 cases under my treatment they were practically organic, fatty degeneration and dilatation having occurred. (Two of these cases died in hospital and enabled me to make an autopsy.) Precordial pain and pain in the chest, palpitation and dyspnea are present and are very distressing symptoms in chronic cases. Vertigo and tinnitius aurium are also other well marked symptoms especially in the later stages and are no doubt adjuncts in causing the inability of the patient to get about and in producing the sleeplessness complained of in many cases.

Nervous System.—Symptoms pointing to this system are languor and lassitude, mental apathy, insomnia and the severe and continued headache, usually frontal often temporal and sometimes the pain is referred to the whole head. Numbness of the feet and formication are complained of as well.

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Blood Examination.—On a microscopic examination, the point that is noticed is an increase of the eosinophiles, but on making a count there is no marked leucocytosis, the percentage of hemoglobin varied but there was a slow but steady decrease as the disease advances, but it was also noticeable that after treatment and when the patient began to improve the red corpuscles increased but the per cent. of hemoglobin often fell before it began to rise.

The following table shows the percentage obtained by me from blood counts in 20 cases: Eosinophiles, 18; polymorphonuclear, 55; large lymphocytes, 8; small

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lymphocytes, 17; other cells, 2; total, 100. Hemoglobin varied from 8 to 40 per cent.

Diagnosis.—The diagnosis of the disease depends not so much on the symptoms, which, although they may be well known, are very often mistaken for those of dyspeptic troubles in the mild cases and of heart disease in the advanced cases, but on the discovery of the ova in the feces. The ova are very characteristic and can not be mistaken for those of any other parasite as they are unstained by bile, while those of the other parasites are usually stained yellow. The ova of the *Oxyuris vermicularis* may be mistaken by beginners for that of *Ankylostoma*, but a little practice enables them to be easily distinguished. The *Ankylostomum* ova are perfectly clear and chitinous, shelled with a granular grayish vitellum, usually segmented into four, sometimes six or eight parts; those of *Oxyuris* are smaller and the vitellum is not segmented but fills up the entire shell. In many cases the temperature is of an irregular intermittent or remittent type, patients complaining that the fever comes on every night or morning, and this fever often causes the disease to be mistaken for malaria. A microscopic examination of the blood soon clears this point, although malaria is very often, especially in certain districts of this island, a complication of the disease, and when the case is treated as one of malaria without an examination of the feces having been made, the practitioner is surprised to find that quinin has, seemingly, no effect on the temperature. (I had a case of this nature sent into hospital—vide report on case attached.)

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The following data are taken from four autopsies made by me at the hospital on bodies of patients who died from advanced uncinariasis. One died suddenly (forty-eight hours) on the second day after admission (this case I have described separately, with a complete history).

General Condition.—The bodies appeared plump and well nourished, the skin was harsh and dry, of a dirty, muddy color, edema of the feet and ankles with ascites was present, and there was serous effusion into the various cavities, viz., pericardium, pleuræ and ventricles of the brain; subcutaneous fat was abundant and yellow in color.

Heart.—The heart was found to be enlarged, fatty degeneration and dilatation being present with incompetence of the valves; the heart walls were thin and flabby, and patches of atheroma were present in the aorta. The cavities were found filled with soft dark clots.

Lungs.—The lungs appeared normal, although pale in color, but in one case advanced pulmonary tuberculosis was present and was no doubt the cause of death. Pleural cavities contained about a pint of clear yellowish fluid.

Spleen.—This organ appeared normal in 2 cases, but in the others was enlarged and fibrous, probably due to malaria, as both cases came from a very malarious district.

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Pigmentation of the skin and mucous membranes may be derived either from the blood or bile or from external agents. In these spots the pigment is deposited chiefly in the mucosa of the papillæ in its lower layers, but also in the upper layers. There is no doubt that disturbed innervation plays a part in producing this result, as is seen in the bronzing of the skin in Addison's disease, which is probably due to inflammation of the abdominal sympathetic. The pigment melanin closely resembles hematin, one of the constituents of the hemoglobin, in its composition, hence we can conclude that it is derived from that source. Its presence is usually associated with two very opposite conditions of nutrition, being sometimes an accompaniment of tissue degeneration and at others of active trophic changes. It is well known that the chlorophyl of plants and the hemoglobin of the blood are intimately associated with respiratory changes. In the majority of cases where pigment is found some concomitant blood change is also present, as, for instance, in malaria, pigment is formed from the destruction of the red corpuscles and deposited in various organs of the body, and without doubt deposition of pigment is very probably under the control of the sympathetic system.

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excreted by the parasites, (1) diminished oxygenating power of the blood from destruction of the blood cells so that carbon waste is not got rid of, (2) presence of hematin from disintegration of the hemoglobin, and in this island (3) we have the third factor, viz., excess of carbonaceous food, as the laborers all live on coarse, bulky food, the quantity rather than the quality being the chief item of importance. The class of people in whom the disease is chiefly seen are the colored races, and, therefore, more liable to pigmentation than those races in whom pigment is not usually present in the skin. From the above facts I am of opinion that this pigmentation of the tongue and buccal mucous membranes and mucous membrane of the intestine has some connection with the disease and may be taken as of diagnostic value, as I have never failed to find the ova and the other symptoms of the disease present in any case which showed this pigmentation.

Another view of its causation may be taken in the dermatitis or "chauffie" affecting the laboring class in this island and which without doubt is the true method of infection, pigmentation of the skin affected takes place so that in this island, where the class affected are dirty in their habits and careless as to what they eat or drink, unwashed fruit and vegetables, muddy drinking water is one method of infection, as during the rains the water supply, which usually consists of shallow wells and ponds, is contaminated to a large extent, and as the larvæ do not take very long to penetrate the skin, as seen from Claude Smith's experiments, it may be possible that, when taken into the mouth, they make their way more easily and quickly into the mucous membrane, and that these pigmented areas are the points of their entrance.

CASE 1.—A. J., aged 19, unmarried, living with his parents, laborer in cocoa estate. Admitted to Colony Hospital, Feb. 2, 1905.

History.—Patient has been ill for the past year with general weakness as he termed it, unable to do much work owing to breathlessness and palpitation. Three weeks prior to admission he had a severe rigor, followed by fever and slight perspiration; fever comes on every day. Has lost flesh and is emaciated. Complexion muddy, lips and buccal mucous membranes very pale, tongue shows minute pigmented spots on lip and sides. Conjunctivæ very pale and scleræ have an icteric tinge, appetite very poor, can only take fluid nourishment, pain and tenderness in epigastrium, nausea and vomiting after food, bowels constipated and have usually been so for the past year. Skin harsh and dry and does not perspire very much, itching sensation over the whole body. Precordial pain and pain in the chest complained of, palpitation marked, with dyspnea in exertion. Dimness of sight, with severe and continued frontal headache and tinnitus aurium. Vertigo and sleeplessness present. Very weak and has not left his bed for the past three weeks. Pulsation of veins in the neck, apex beat depressed and to the left; marked bruit in third left intercostal space. Pulse soft and compressible.

Examination of Feces.—Ova of uncinaria present in large numbers with those of *Ascaris lumbricoides* and *Tricocephalus dispar*. No blood in the stools.

Examination of Blood.—Malaria Estivo-autumnal parasite present. Eosinophiles, 20; polymorphonuclear, 58; large lymphocytes, 10; small lymphocytes, 12.

Temperature on admission, 102.6, rising on the day after to 104 degrees. No marked rigor or diaphoresis.

Diagnosis.—Ankylostomiasis or uncinariasis. Complication, malignant malarial fever.

Treatment.—Saline aperient every morning. Hypodermic injection of quinin bihydrochlor. grs. 5 every morning at 10 and in the evening. Diet: Milk, beef tea, arrowroot, etc.

Course.—Temperature still continued. February 17 blood re-examined and found free of malarial parasites. Temperature, 99.8. Feces contained the ova in numbers. February 20, 120 grs. thymol given in cachets of 40 grs., followed by a saline aperient, four hours after the last dose, stools carefully washed and found to contain large numbers of worms. Temperature reduced, but still above normal. Thymol repeated February 23 and stools examined worms still being passed.

Repeated thymol February 26 and 28, and after the last dose only a few worms (6) were found in the last stool.

Feces examined March 2, no ova present, but thymol repeated once more and a week later they were again examined, but no ova present, similarly on the 17th.

The diet was now changed, as appetite had increased, after the second dose of thymol the headache disappeared and the tinnitus was very much decreased, and patient slept well at night. He was now put on the following mixture as well:

℞. Tinct. ferri perchlor.	℥iiss	10
Liq. arsenitis hydrochlor.	℥i	4
Mag. sulph	℥iv	15
Syrupi aurantii	℥iss	6
Aquæ q. s. ad	℥viii	240

M. Sig.: One tablespoonful three times a day after meals.

Blood examination, March 2: Eosinophiles, 15; polymorphonuclear, 65; large lymphocytes, 10; small lymphocytes, 7. Hemoglobin percentage, 22.

Blood examination, March 31: Eosinophiles, 13; polymorphonuclear, 45.5; large lymphocytes, 14.8; small lymphocytes, 26.2.

Patient is doing well, has gained weight and flesh, all symptoms have disappeared, skin moist. Rapid and uneventful convalescence.

CASE 2.—R. G., aged 36, married, children, laborer.

History.—Patient has been ill for past six years, gradually getting worse each year; weakness, fever, breathlessness and palpitation, disinclination or inability to work. Husband and children also affected similarly. Has had "chauffie" very often, particularly after or during the rains. Appearance plump and well nourished. Very anemic; has been very ill for the past month; bedridden; brought to hospital in a chair.

Examination.—General anasarca very marked, ascites developed, face and scalp puffy and edematous. Says she never perspires, appetite lost, pain and tenderness in epigastrium, vomiting after food. Tongue very pale and white, teeth indentalious on tongue, numerous minute pigmented spots on lips and sides, with bluish streaks on side as well.

Superficial veins of abdomen distended, diarrhea, feces yellowish brown, no blood; on examination ova of ankylostoma and ascarides were seen. Liver enlarged, abdomen tender on pressure, ascites present. Precordial pain and pain in the chest very severe, dyspnea extreme, cough troublesome, bases of lungs dull on percussion.

Extreme vertigo, marked tinnitus aurium with severe continued frontal headache, sleeplessness and has had fainting attacks.

Vision dim, great weakness. Heart markedly dilated, with bruits, pulsation of veins in neck; apex beat full and diffused. Pulse 110, weak and dicrotic. Urine normal, patient quite sensible, but prefers being left alone. Temperature on admission 97.8.

Diagnosis.—Ankylostomiasis, chronic.

Treatment.—Milk and beef tea, stimulants.

Patient did not do at all well, and died suddenly on the second day after admission.

Blood Examination.—Eosinophiles, 8; polymorphonuclears, 56; large lymphocytes, 6; small lymphocytes, 30. Hemoglobin, 10 per cent.

Morbid Anatomy.—Lungs: Very pale, but otherwise normal; bases edematous and pleural cavities contained about 2 pints of straw-colored fluid.

Heart: Pericardium contained 4 ounces of serous fluid. Heart very much enlarged and dilated; cavities filled with soft dark clots. Fatty degeneration present in the walls; valves inefficient.

Liver: Enlarged, pale and fatty degeneration present. Abdomen contained large quantity of ascitic fluid.

Spleen: Slightly enlarged, pale but otherwise normal.

Intestines: Jejunum and duodenum both contained large quantities of the worms, most of which had dropped and were lying in the lumen of the bowel. Mucus present in large quantities. Large intestine contained dark yellowish brown fluid feces. Intestinal wall thin and atrophied in parts, presenting large numbers of minute hemorrhagic and pigmented spots.

Stomach: Signs of chronic catarrh present; no worms in the cavity itself.

Kidneys: Pale and otherwise normal.

Brain: Anemic and ventricles filled with fluid. Pia mater stripped easily off the cortex, serous fluid beneath it filling the sulci.

Death in this case was due to mitral inefficiency, resulting from dilatation of the heart caused by chronic uncinariasis or ankylostomiasis.

TREATMENT.

Thymol is the drug employed by me and I have had the very best results with no single ill effect even in children. The dose usually given by me varies with the age of the patient and also his general condition; it ranges from 10 grains to a child to 40 grains for an adult at a single dose.

The following is the procedure adopted by me at the Colony Hospital: The patient is carefully prepared for three or four days after admission, the bowels are kept active by saline aperients administered every morning in sufficient dose to cause one evacuation, the diet is light and easily digested, viz., milk, beef tea, arrowroot, etc., with pepsin if required. In very advanced cases with cardiac troubles, stimulants and cardiac tonics administered. The chief object in the administration of the aperient being to get rid of the mucus with which the intestine is often loaded and in which the parasites lie buried.

At 10 p. m. on the night prior to the administration of the thymol a dose of saline aperient is given and no food except a pint of milk given to the patient next morning and two hours afterwards the first dose of thymol is given. I give it in the form of cachets each containing five grains for a child and 40 grains for an adult and one cachet is taken every hour till 15 grains are given to the child and 120 grains to the adult. In old people and very advanced cases in adults I usually give 30 grains instead of 40 grains. No food is allowed the patient and four hours after the last cachet is given a saline aperient is given and the patient allowed his diet. The stools are collected and carefully washed and invariably show a large quantity of worms, in the case (1) described by me 500 worms were passed after the first administration of thymol. The above treatment is carried out on three alternate days, occasionally an interval of four or five days is allowed in debilitated cases; the feces are carefully examined for ova a week afterwards and usually found free of ova. The feces are again examined two days before the patient is discharged and it is my invariable practice to give another single dose of thymol and to carefully examine the stools again. The after-treatment of the case consists in the administration of tonics, chiefly iron and arsenic, often combined with strychnin; the diet is increased, but is still one which is easily digested and nourishing and usually the patients seek their discharge in from a fortnight to three weeks after the feces are free of ova; and are recommended to continue the tonic at their own homes for a still longer period. I usually administer the iron and arsenic in the form mentioned in the report of Case 1, above, as I find it gives the best results in a shorter period of time.

The saline aperient used by me and which is preferable to any other aperient is the following:

℞. Sodii sulphas.
Mag. sulphas., āā.....3iss 6
Aquæ ad 3ii 60
M. Sig.: Drink.

As I have previously stated, I have had no ill effects from administering thymol, although a few cases have complained of dizziness and a sensation of fainting, but it has gradually passed off; it is, as we know, a very insoluble drug except in spirits and oils and therefore is not absorbed in sufficient quantity to cause toxic effects, besides which the saline purge given shortly after the last dose hurries it out of the system although sufficient time has been given the thymol to act on the parasites, and besides this there is no doubt that sodium or magnesium appears to be an antidote.

A remarkable fact and one which confirms me in the use of thymol is the immediate relief given by the first administration of the drug, from the severe headache and other mental symptoms, the patient next day feeling much brighter and better. Bentley recommends and prefers betanaphthol to thymol. I have not tried this drug as yet, being so far satisfied with my results from thymol, but I intend giving it a trial and comparing the results.

PROPHYLAXIS.

In this island the two chief factors in the causation of this disease are (1) muddy and infected drinking water; (2) soil pollution and infection through the skin. With regard to the first, it has been doubted whether this factor is a true one, yet I have had two cases of this disease in which there was no history of dermatitis, the patients being fairly well to do and not exposed to the second method of infection, but they admitted that the first cause might be the real one, as the water supply was obtained from shallow wells, liable to infection and especially during the rains was often muddy.

However, there are only three methods of prevention, viz.: 1, prevention of water infection; 2, prevention of soil infection; 3, treatment of all cases of the disease.

The two last are the chief ones. In this island the disease is widespread throughout all the districts, especially on the estates and in certain villages, hence the chief essential is the prevention of the fecal contamination of the soil in order to eradicate the disease; the promiscuous depositing of feces near the huts and villages and in the fields should be prevented, but owing to habit and the low intelligence of this class, it seems an impossibility. On all estates where huts are provided for the laborers and other families easily accessible privy accommodation should be provided, pits and trenches would do, which could be filled in from time to time and fresh ones opened. Another point is to try to destroy all ova and larvæ on heavily infected fields by ploughing the earth over and burning bush fires over it and replanting, but as most of the cultivation here is cocoa this is an impossibility; these cocoa groves are the chief infected areas, as here the ova have the ideal humidity, shade and temperature for their growth and development. The people should, therefore, be made acquainted with the danger of depositing feces promiscuously and thus infecting the soil and the liability of their acquiring the disease owing to the nature of their work, barefooted. The next point is the proper examination and treatment of all cases of the disease. On

all estates and in villages an examination of all cases of dyspeptic troubles, dermatitis and anemia should be made and the feces examined and if the ova are found, immediate treatment of the case begun so as to prevent their becoming a source of danger to others who are not infected. This can not be done without an outlay on the part of the estate owner or the government itself, but there is no doubt that to thoroughly eradicate this disease such measures must be adopted; otherwise the treatment of cases individually is of little use, for as soon as they are cured and go back to their work, they are reinfected again.

DISCUSSION.

DR. V. A. LATHAM, Chicago, said that the southern parts of this country were now confronted with this condition. In patients with ankylostomiasis the whole system stops developing; they are anemic, frail and almost infantile in their actions and characteristics.

DR. EUGENE TALBOT, Chicago, said that two or three similar cases have occurred in this country, but not enough to warrant the conclusions brought out by Dr. Leonard. One occurred lately in southern Illinois.

THE PREVENTION OF SUMMER DIARRHEA.*

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PHILADELPHIA.

During the hot summer months, the mortality from diarrhea among infants and young children is very great. Attention has frequently been called to this during the last five years, and much has already been accomplished by the health officials of the large cities of the United States in the prophylaxis of summer diarrhea.

Summer diarrheas are due chiefly to two causes, unclean food and hot weather. Bacteria of various sorts, whether introduced from without in the food, or already present in the intestine, are undoubtedly the exciting causes; but they seem unable to act deleteriously until the vital resistance of the child has first been decidedly weakened by protracted heat or humidity. Hot weather may also bring about deterioration of the milk, which forms the baby's usual food, by favoring the increased production of bacteria in the milk.

As the chief cause of what Dunn[1] so aptly calls "thermic diarrhea" is the heat, our efforts in the prevention of summer diarrhea must be directed toward overcoming the heat, so far as is possible. On the appearance of the first sign of any gastrointestinal derangement, all milk must at once be stopped and barley water or whey given.

Parents, educated or ignorant, poor or rich, must all be taught many things, among others, to bathe infants regularly and often; to keep excessive clothing off; to keep them cool and in the open air; not to disturb them unnecessarily, for playing or petting, so that they secure sufficient sleep; to attend to soiled napkins early; and to realize the importance of keeping off flies. Correct breast and bottle feeding, the correct frequency of feeding, the correct quantity to be given at correct intervals, the correct cleansing of nipples and bottles, the furnishing of a "clean" milk, the precautions necessary to keep it clean, etc., must be taught and must be so clearly expressed that they are plainly understood by all.

This is perhaps best accomplished by the judicious distribution of printed pamphlets containing instructions to mothers for the care and feeding of infants during the heated term. Of the fifteen largest cities of the United States, all containing over 250,000 inhabitants, such booklets are now distributed only by nine: St. Louis, Baltimore, Cleveland, San Francisco, Cincinnati and Pittsburg not as yet issuing any. Four cities have them printed in several languages: Chicago, in English, German, Bohemian, Polish, Swedish, Norwegian, Italian and Yiddish; Buffalo, in English, German, Polish and Italian; New York, in English, Italian, and Yiddish; and Milwaukee in German and English. Philadelphia, Boston, New Orleans, Detroit and Washington have the pamphlets printed in English only. Those distributed in Boston are dated 1879; those in Chicago, 1895, and those in New Orleans, 1899. Those now issued in New York and Washington were printed in 1904; those in Philadelphia, in 1905.

I wrote to the health officials of the nine cities containing from 150,000 to 250,000 inhabitants, but received no answer from Newark, Louisville, Indianapolis or Kansas City, which cities, I presume, do not issue any such pamphlet. St. Paul does not, either. In Minneapolis and Jersey City the pamphlets are printed in English only; in Providence, in English, French and Italian; and in Rochester, in English, German, Italian and Yiddish.

It would seem advisable to have special "milk" courses given in the public schools, the high schools especially, and in the medical schools and hospitals, for the instruction of growing children, physicians and nurses. The fact that clean milk can be procured will then be recognized. In cities in which such milk is obtainable, as the result either of municipal or private enterprise, the public will notice the difference between ordinary dirty milk and that receiving certificates from a milk commission such as is already in existence in many cities. This milk is kept up to standards which are vouched for by an expert bacteriologist, an expert chemist and an expert veterinarian. Such certified milk must be free from pathogenic micro-organisms and contain not more than from 10,000 to 30,000 to the c.cm., varying in several cities; its specific gravity must be between 1,029 and 1,033; its reaction must be neutral or faintly acid; its proteid should vary between 3.5 and 4 per cent.; its sugar between 4.2 and 4.8 per cent.; its fat between 3.5 and 4.5 per cent.; and it must be free from impurities, coloring matters and chemical preservatives. Besides, the condition of the dairy and the cows must be kept excellent.

In order to supply such clean milk to rich and poor alike, it would be well for every large city to acquire a dairy in the outskirts of the city, to be run on modern methods, under the guidance of a milk commission. Such a dairy might come under the jurisdiction of the municipal health department, and the city bacteriologist could easily watch that the milk and cream there prepared be kept up to the standard required. Each city could then supply clean milk to its citizens, and a municipal laboratory might be established for the preparation of mixtures which could be ordered by any phy-

* Read in the Section on Diseases of Children of the American Medical Association, at the Fifty-sixth Annual Session, July, 1905.

1. Charles H. Dunn: "Etiology and Classification of the Summer Diarrheas of Infancy." Archiv. of Ped., June, 1905.

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sician on prescription blanks, free, or at a nominal price to the poor, at ordinary prices to those able to pay.

Should the powers that be object to the expense of such an undertaking, such a dairy, and possibly laboratory also, could be established by private subscription for the use of the poor only. Something like this was attempted in St. Louis last summer. As, at that time, there were no stringent regulations to standardize the cream and milk used, the purity of the mixtures prepared may be questioned. Rules have since been adopted, however, by the St. Louis Milk Commission, which will bring the milk and cream up to the standards maintained by the milk commissions of Eastern cities. While these modified mixtures have been distributed in St. Louis to anyone bringing a physician's prescription, milk funds, limited in distribution to the patients of certain hospitals or dispensaries, have for some years been in operation in Boston, Baltimore and Newark, with success.

In New York and Philadelphia, Mr. Nathan Straus gave the plants in which are prepared the modified mixtures distributed in both cities. Unfortunately, he has insisted on the pasteurization of all mixtures. Recent researches by Pennington[2] prove that commercially pasteurized mixtures, though prepared from clean milk and cream, contain after pasteurization more bacteria than before. Bergey,[3] Evans and Cope[4] have also shown the practical uselessness of pasteurization and sterilization, when performed more than from four to eight hours before the mixture is to be used. These researches do not, however, reflect on home pasteurization, correctly performed, in closed, filled bottles, when for any reason it is feared that the milk is not clean. How much better off would the community be, were we able to furnish a clean milk to all, so that neither pasteurization nor sterilization need even be thought of! Sterilization causes decided changes, those which occur whenever milk is boiled, and should never be employed; while pasteurization, always an iniquity, though occasionally a necessary iniquity, can also be dispensed with when clean milk and cream are used.

The simplest method for distributing milk and feeding infants in hot weather is that established in Rochester, in 1900, by Dr. George W. Goler. His efforts led to the furnishing of a clean milk and from that time pasteurization has been omitted. Several months ago, an association for the improvement of the milk supply of New York City was formed by 40 of the largest milk dealers, to assist the health department to secure clean milk. This society intends to educate the farmers and then to inspect the dairies regularly.

After studying the municipal pamphlets already in existence, I have prepared the following sample pamphlet for distribution by municipal health departments. In this I must acknowledge my indebtedness to the departments of health of Rochester and of New York City.

On the outer cover should be the name of the city, with the words "Health Department," "Department of Health," or "Bureau of Health," followed by the title of the pamphlet "Instructions to Mothers for the Care and Feeding of Young Children During the Hot Weather."

Inside the cover should be the following:

Clothing.—During the very hot weather infants should wear only a napkin and a thin gauze shirt. An abdominal binder, of thin flannel, may be worn until the child is six months old.

No infant should ever wear starched, stiff, uncomfortable clothes; everything should be loose.

Clothes worn during the day should be washed and hung out to air at night, while those worn at night should be washed or aired during the day.

Bathing.—Every young child needs at least one tub bath every day. On very warm days babies should be sponged two or three times a day with luke warm or cool water, containing a teaspoonful of salt to a pint of water, or a little alcohol or vinegar.

Poorly nourished infants should also receive a mild general rub with sweet oil once daily, after the morning bath.

The baby should be bathed before feeding; never bathe a child soon after feeding.

Talcum powder may be used freely after the bath. If slight chafing occur, stop using the powder and smear the parts well with boric ointment; if the chafing persists, consult your physician.

Fresh Air.—Fresh air is of vital importance. Keep the windows open. Never keep a child in a close or crowded room.

Have the child in the open air all day during the hot weather, out of the sun, protected from strong winds, bright sunlight and flies.

Whenever possible, if advised by your physician, take a trip on the water, to the country or seashore. Trolley rides are of value, provided you protect the infant from strong winds.

Instead of sweeping the baby's room, mop furniture, walls and floor with a moist cloth. This does not raise dust, which might contain germs.

Sleep.—Every young child should have twelve hours sleep at night. Naps of about two hours, morning and afternoon, should be insisted on until the child is 3 years old.

Each child should sleep by itself, in a crib or coach; this is most important in warm weather, when the heat of the mother's body, lying near, keeps the baby too hot.

Soiled Napkins.—Napkins should be changed frequently, just as soon as soiled. They should be placed in some covered receptacle, in water, and should be washed and boiled as soon as possible.

Never use oilcloth or waterproof materials for napkins; they keep the child's body hot and moist.

Do not wash or dry napkins in the room occupied by the baby.

Flies.—It is important to keep flies away from children and their food. For flies come from dustbins, manure and refuse heaps, readily carrying germs to children and into their food, when it is left uncovered. Windows and doors should always be screened and the baby's crib should be covered with mosquito netting. Whenever the child is taken out, the coach should be covered with netting to protect the baby from mosquitoes and flies.

Breast Feeding.—Always nurse your baby unless your physician advises you not to.

Keep your nipples scrupulously clean, washing them with cool boiled water before and after each nursing.

Each breast should be nursed at alternate feedings; both breasts should not be given the infant at one feeding unless specially ordered by your physician.

The mother's bowels should be moved once daily; she should take three plain, well-cooked meals a day, of milk, cereals, meat and vegetables. She needs plenty of milk and water; but she should not take tea, strong coffee, or liquor.

In very hot weather, or when overheated, she should "milk" her breasts, throwing away several teaspoonfuls of her milk before allowing the child to nurse.

Bottle-Feeding.—Procure the cleanest, freshest milk possi-

2. Mary E. Pennington: "Comparison of Pasteurized and Raw Milk," read before the Philadelphia Pathological Society, Feb. 23, 1905.

3. D. H. Bergey: "The Influence of Pasteurization on the Chemical and Physical Qualities of Milk," read before the Philadelphia Pathological Society, Feb. 23, 1905.

4. Joseph S. Evans, Jr., and Thomas A. Cope: "The Inhibitory Power of Unheated Milk on Bacteria," read before the Philadelphia Pathological Society, Feb. 23, 1905, and before the Philadelphia Pediatric Society, May 9, 1905.

ble. Where possible, use certified milk. Do not skim the milk. Clean milk and cream are delivered in covered bottles. These should never be allowed to stand uncovered; nor should milk ever be carried in an uncovered receptacle. For dust or flies, both bearing germs, may enter it. Milk and cream should always be kept cold; in a refrigerator when possible; if you have no ice, wrap a cloth wrung out of cold water around the bottle.

Have the baby weighed every week up to six weeks of age; then every two weeks, regularly; and feed it according to the following table:

2 Tablespoonfuls, 1 ounce; 6 teaspoonfuls, 1 tablespoonful.

Weight.	Milk.	Barley Water.	Granulated Sugar.	Intervals between feeding	From 6 a. m. to 6 p. m.	From 6 p. m. to 6 a. m.
From 6 to 8 lbs. Under 3600 g.	1 oz.	2 oz.	½ teaspoonful	2 hours	6 bottles.	2 bottles.
9 and 10 lbs. 3700-4500 g.	1½ oz.	2½ oz.	½ teaspoonful	2 hours	6 bottles.	2 bottles.
11 to 14 lbs. 4600-6400 g.	2½ oz.	2½ oz.	¾ teaspoonful	2½ hrs.	5 bottles	2 bottles.
15 and 16 lbs. 6500-7200 g.	3½ oz.	2½ oz.	1 teaspoonful.	2½ hrs.	5 bottles.	2 bottles.
17 and 18 lbs. 7400-8200 g.	5 oz.	2 oz.	1 teaspoonful.	3 hours	5 bottles.	1 bottle.
19 and 20 lbs. 8300-9000 g.	8 oz.	0 oz.	1 teaspoonful.	3 hours	5 bottles.	1 bottle.
21 and 22 lbs. 9100-10,000 g.	10 oz.	0 oz.	½ teaspoonful	2 hours	5 bottles.	0 bottle.

In every case make one-tenth of the mixture lime water; this may be procured at any drug stone. It is added to prevent vomiting.

Barley water is made by boiling whole barley, two tablespoonfuls, or barley flour, one tablespoonful, for 15 or 20 minutes, in one pint of water; strain and add boiled water to make one pint again. This is used both to dilute the milk and to help the baby digest the cow's milk.

Should the baby fail to gain in weight at the end of two weeks, clean cream may be added cautiously, beginning with one teaspoonful to each bottle, and gradually increasing. Your physician will tell you how much cream you may add; as a rule, more than one-tenth of the mixture should never be added. (For example, a baby weighing 8 pounds gets 3 ounces, 6 tablespoonfuls, or 24 teaspoonfuls, at each feeding. More than one-tenth of this quantity, i. e., 2½ teaspoonfuls, of cream should never be added.) If you are not sure that the cream is clean, boil it; and boil the sugar and water, too; then add them to the clean milk when cold.

Should the baby develop vomiting or diarrhea, stop all milk at once and give barley water only until whey can be made. If your physician advises it, prepare the whey by adding one teaspoonful of liquid rennet or essence of pepsin to one pint of milk which has first been heated. Or dissolve one rennet tablet in one ounce of cold water and add this to one quart of milk; then heat it to about 100 F., and allow it to stand. When the curd has become solid, beat it up well with a fork, and keep it warm for 10 or 15 minutes longer. Then strain and put the whey on ice.

Some days later, if your physician advises it, add one teaspoonful of milk cautiously, to each bottle, after having heated the whey up to 155 F., to stop the further action of the rennet. The quantity of milk or cream to be added, later, is to be regulated by your physician.

Whoever prepares the food should wash her hands regularly before beginning to make the mixture.

Before each feeding the bottle is heated in water, resting on a saucer, until the water under and about the bottle begins to boil; it should not be allowed to boil. The bottle is then removed and allowed to stand, to cool off somewhat before the baby gets it.

Before taking the breast or bottle, the baby's mouth should be cleansed with cool boiled water. Between feedings every child, whether breast or bottle fed, should be given cool boiled water to drink, frequently, from several teaspoonfuls to a tablespoonful at a time.

No child should be fed more frequently than here given, nor should a larger quantity be given at any feeding without the special advice of your physician. When any milk remains in the bottle, always throw it away; do not heat it over again.

When the warm weather begins, it is a wise precaution to reduce the strength of mixtures given bottle-fed babies, in fat especially, as a child is often unable to digest its regular food during hot weather. This alone may prevent illness.

All nursing bottles should be cleansed thoroughly, first with cold water, then with washing soda and hot water; and then rinsed well and boiled before using. Nipples should be turned inside out and scrubbed in cool boiled water and borax, 10 grains to the ounce, with a brush used for this only. All nipples should be boiled once daily. At least six bottles are needed. After cleansing them, stand them upside down on a shelf. The nipples should be kept in cool boiled water, in a covered receptacle. Bottles with twisted necks and nipples with tubes should never be used.

Weaning.—When the child is 10 or 12 months old, it should be weaned, except in hot weather, when the breast or bottle may be continued until the autumn. Weaning is accomplished by substituting pure milk, or a modified milk mixture when ordered by your physician, in a cup or glass, for the breast or bottle, once daily at first; then twice, increasing gradually until the child only takes milk by the glass.

Feeding After First Year.—At 1 year of age, two, and later four or five meals a day may be given, gradually increasing the amount at each feeding. The meals should be composed of some of the following: Milk, stale bread or toast with butter, soft boiled eggs, strained beef, mutton or chicken broth, and cereals (oatmeal or hominy cooked three hours; cornmeal cooked two hours; or farina cooked one hour).

At 2 years of age meat may be added cautiously. The child should then take only three meals a day, with water or milk regularly between meals. Supper should consist of milk, bread and butter, and a cereal.

No child should ever be given tea, coffee, or liquor; fried food of any kind; griddle cakes, sausage or pork; heavy, doughy puddings, fresh bread, cake or pastry; unripe, sour or over-ripe fruit; bananas; very sweet preserves, popcorn, candies, etc.

Too much food is always worse than too little, especially in hot weather.

Never give a baby sleeping drops, anodynes or soothing syrups.

Never allow children to creep about on the floor; for there is danger of cold draughts of air, and of dust containing germs.

Let the baby alone; don't disturb it unnecessarily, to play with it, pet it, or handle it.

Have the baby vaccinated before it is 1 year old.

Summer Diarrhea.—If the baby passes several loose stools, with or without vomiting, the child needs medical attention.

Stop all milk food at once, and give the baby boiled water or barley water, if less than 1 year of age; or whey if over 12 months, until it can be taken to a physician.

Even simple cases of vomiting and diarrhea should never be neglected, for the disease is often mild at first, without any sign of illness other than diarrhea; yet, in a few hours, the baby may be dangerously ill.

If you have no physician and there is no hospital near, telephone to the Board of Health and a district physician will be notified.

The objection which can be raised to this method of simply diluting milk is, of course, the very low fat percentage in the mixtures; but this, as a rule, is just what is needed during hot weather.

When the baby fails to gain, small amounts of cream can easily be added. The objection to this, however, is the fact that the cream, in hot weather especially, will contain far more bacteria than the milk. This objection may be overcome by boiling the small quantity of cream separately, by boiling sugar and water, and by adding them, cold, to the clean milk. If the baby then has indigestion it may be due to too much fat, but it is more probably due to the infant's inability to digest the

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caseinogen of cow's milk. This, however, is much decreased by the use of whey, which can be easily prepared. The proteids can then be raised easily, with a very gradual increase in the fats, by adding milk; or the fats may be raised rapidly by adding cream.

The manner of distributing these pamphlets also needs consideration. They should be given away by both district physicians and medical inspectors. Whenever, in hot weather, either has occasion to visit a home in which there are children under 3 years he should not forget to leave a pamphlet. The pamphlets should also be sent to dispensaries, and milk and ice stations for free distribution. Some should also be sent to every physician in the city, for the benefit of his patients, and he should be informed where more can be procured. In cities with a large foreign population much can be done by having the pamphlets printed in several languages. It seems important also to have these instructions reach the well-to-do as well as the poor, for it is only by furnishing clean food and educating mothers and nurses that summer diarrhea can eventually be overcome.

225 South Twentieth Street.

DISCUSSION.

DR. C. F. WAHRER, Fort Madison, Iowa, declared that every case of summer diarrhea is a case of itself; there are so many known and unknown factors such as surroundings, predisposition and food. Two of the principal reasons of an increased number of cases in the summer are increased putrefactive changes in foods of bacterial origin, and the worry and disturbance to the nervous system. He said that he went out to see milking done at one of the finest hotels in Yellowstone Park. The cows were deep in the mire that they made themselves. He saw the milkman come out, unkempt, unwashed, pick up a milk stool, give a cow a kick, stroke the udder and begin to milk. The whole place was literally covered with what in the Anglo-Saxon would be called "cow dung." Much of the milking on farms, Dr. Wahrer believes, is done in the same manner so that the milk is mixed with the filth, hence it is very difficult to control the supply of milk to bottle-fed children. In the larger cities mothers who are subjected to work akin to that of the beast of the field are nursing their children. Such a mother can scarcely give healthy milk, and the unsanitary mode of life of the mothers should be changed. Dr. Wahrer agreed with Dr. Ostheimer that education is necessary. He does not think any mother would transgress the rules of cleanliness, etc., if she were taught the importance of the care of the milk supply.

DR. L. M. SILVER, New York, said that in New York City there is a list of charitable summer work for children. Mothers interested are given cards of admission. Each mother is given a printed slip with instructions for the care of milk and for the preparation of barley water.

DR. KATE LINDSAY, Boulder, Colo., stated that her practice has been mostly in the farming districts, and that there the ignorance with reference to infant feeding is quite as lamentable as in the cities. As an illustration she related one of her cases. She was called to see a child with summer diarrhea. At the same time a veterinarian was called to see a colt. The farmer was in a great rage because his best mare had been driven and overheated. At the same time he required his wife to cook for sixteen men and to sweat over the fire. Dr. Lindsay examined the milk and found it deficient in every way. Education along this line is needed among the farmers of the country. Dr. Lindsay would not discourage efforts to educate the people of the slums, but asked why we should not take care of the best as well as the worst in the land.

DR. G. BLUMER, San Francisco, said that there are a few cases of summer diarrhea in San Francisco, occurring usually after the occasional hot spells in that city.

DR. ARTHUR W. FAIRBANKS, Boston, asked Dr. Ostheimer how long he keeps the children on a cereal mixture. There is always some uncertainty in Dr. Fairbanks' mind on this point. He also asked what the indications are for taking the child off the milk, whether it is fever, temperature or general septic signs.

DR. A. C. COTTON, Chicago, said that all physicians appreciate the idea of the education of the laity by means of pamphlets. He believes that health department work has obtained some of its best results through the circulars issued to mothers. Dr. Cotton would put such instructions in a place of honor and have the mother taught to look at them as her lode star. The mothers should be taught particularly that there is a beginning to this trouble, and that often this is in the method of nursing or feeding. The little regurgitation which comes with too rapid feeding will cause indigestion and summer diarrhea follows. For summer feeding the food should be diluted. A lower caloric value of the food is needed. In artificial feeding we are not feeding according to nature, but according to experience, and attenuated food is more easily digested.

DR. JOHN LOVETT MORSE, Boston, declared that he objected to the title, "Prevention of Summer Diarrhea." He thinks it ought to be "Prevention of Diarrhea in Summer." He stated that it should not be forgotten that whey is milk and that bacteria will grow in one as well as in the other.

DR. MAURICE OSTHEIMER, in reply to a question, stated that the length of time the child is kept on barley water depends on the symptoms. It may be from twenty-four to forty-eight hours; in extreme cases perhaps seven or eight days, but in these cases he should add brandy or whisky, so that the baby gets some nourishment. In most cases, however, he gives no alcohol while on barley water. On the first sign of gastrointestinal derangement he would stop the milk, even if for only twenty-four hours. As Dr. Cotton has said, the regurgitation of food is one of the first signs of trouble and ought to attract the mother's attention. In reply to a question Dr. Ostheimer stated that when pasteurization is done in bulk the bacteria are increased tremendously. Whether they are the same bacteria which are found in the beginning he does not know; whether they are pathogenic is another question; he does not believe that they are. In Philadelphia a great deal of work has been done in this connection, and the importance of keeping milk clean has been proved.

FIFTEEN CASES OF SUMMER DIARRHEA.*

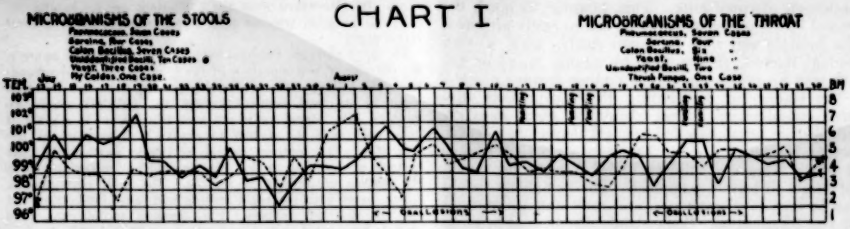
JOHN C. COOK, M.D.

CHICAGO.

The fifteen cases of summer diarrhea which I wish to present, have been selected from the two hundred and fifty cases of children's diseases that came under my observation at the Jackson Park Sanitarium, Chicago, during the months of July and August, 1904. For the sake of brevity I will divide these cases into two classes. The first class comprised eleven cases of a mild type, the records of which have been combined in such a way that they will serve as a standard of comparison by which to estimate the value of the findings in the remaining cases. The second class comprises four fatal cases which are of special interest because of the bacteriologic and microscopic findings both during the clinical course and at postmortem.

As briefly as possible, I will relate the findings to which I wish to call attention. The average age of these infants was nine and one-third months. Personal and family history is what would be expected in a class of charity patients, breast fed by poorly nourished mothers, and artificially fed on every sort of milk and infant food. The average course of temperature is shown in Chart 1; it varied from 97 to 102.5 F., with a total average of 99.4. Vomiting was present, but was not by any means a constant symptom. The frequency of

* Read in the Section on Diseases of Children of the American Medical Association, at the Fifty-sixth Annual Session, July, 1905.



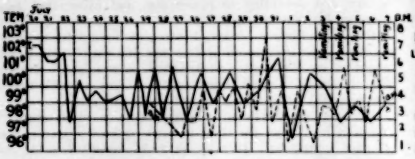


CHART II

MICROSCOPICAL AND BACTERIOLOGICAL FINDINGS POST MORTEM

LUNGS — Bronchopneumonia

KIDNEYS — Diffuse Parenchymatous Nephritis

SMALL INTESTINES — Ulcerations

BLOOD — Pneumococcus

PERITONEAL FLUID — Pneumococcus

ALL THORACIC AND ABDOMINAL ORGANS — Pneumococcus

CHART III

MICROSCOPICAL AND BACTERIOLOGICAL FINDINGS POST MORTEM

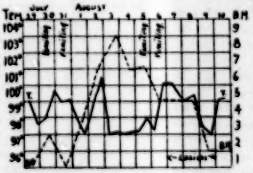
LUNGS — Bronchopneumonia

KIDNEYS — Diffuse Parenchymatous Nephritis

BACTERIOLOGICAL EXAMINATION

LUNGS — Pneumococcus

OTHER ORGANS — Sterile



MICROORGANISMS OF THE STOOLS:—

Colon Bacillus

An Unidentified Bacillus

Pneumococcus

Thrush Fungus

MICROORGANISMS OF THE THROAT:—

Sarcina

Pneumococcus

Thrush Fungus

Colon Bacillus

CHART IV

BACTERIA OF THE THROAT:—

Colon Bacillus

Sarcina

Pneumococcus

BACTERIA OF THE STOOLS:—

Colon Bacillus, Sarcina, Pneumococcus

Red Pigmenting Bacillus of the Colon Group

Typhoid Bacillus, Streptococcus

REPEATED WIDAL TESTS—POSITIVE

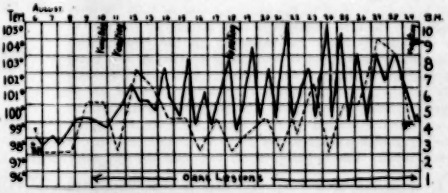
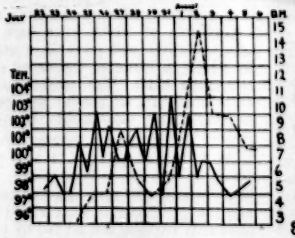


CHART V



NOTE

In the stools of this case a Red Pigmenting Bacillus of the Colon Group was isolated. This pigment stained the stools blood-red but no blood was found upon microscopical examination.

bowel movements also I have placed on Chart 1. They varied from two to seven a day, with a total average of four. Lesions were present in the mouth in three of the eleven cases, but were mild and readily yielded to treatment. The differential blood findings were as follows: Small lymphocytes 27 per cent., large lymphocytes 16 per cent., neutrophiles 53 per cent., eosinophiles 2 per cent., myelocytes 2 per cent. The parasitic and bacteriologic findings of the stools were as follows: The pneumococcus was present in seven cases, sarcina in four, colon bacillus in seven and unidentified bacilli in ten, yeast in three and mycoides in one,

with a total of three varieties in each case. Of the bacteriologic findings of the throat, the pneumococcus was present in seven cases, sarcina in four, colon bacillus in six, yeast in nine, unidentified bacilli in two and thrush fungus in one. There was a total average of three varieties in each case.

I will now take up the findings of the second class of cases. The first of these was a male, aged 6 months. No history was obtained; the child was under observation from July 16 until his death, August 7. The temperature range, which is shown on Chart 2, was moderate, from 97.8 to 103.5 F., averaging throughout the course of the disease 99.6. As is also seen on Chart 2, there was a range of from two to seven bowel movements daily, with an average of four. Lesions in the mouth were constantly present. Vomiting occurred in the last five days only. Neither blood nor bacteriologic examinations of the stools and throat were made during life, but the microscopic and bacteriologic examinations postmortem are important. The microscopic examination of the lungs showed well marked bronchopneumonia. In the kidneys a diffuse parenchymatous nephritis had developed. The small intestines showed an exfoliation of the epithelial and mucous coats with a round cell infiltration of the muscular layer. Bacteriologic examination showed the presence of the pneumococcus in every organ, as well as in the blood and peritoneal fluid.

The second of the severe cases was a female aged three months. This case was under observation from July 29 and came to autopsy August 10. The child had been fed on a proprietary food, otherwise the history was negative. As can be seen by Chart 3, the temperature course was very mild, between 98 and 101.5 F., averaging about 99 degrees. The bowel movements averaged six a day, reaching the highest number, nine, six days before the child died. Vomiting occurred three times. Lesions of the mouth were present during the last days of the disease. The differential blood findings were as follows: Small lymphocytes 38 per cent., large lymphocytes 20 per cent., and neutrophiles 42 per cent. There was in all, four varieties of micro-organisms in the stools, the colon bacillus, an unidentified bacillus, the pneumococcus, and the thrush fungus, which was very abundant. In the throat also four varieties were demonstrated—the colon bacillus, pneumococcus, sarcina, and thrush fungus. An autopsy was held, which resulted in the disclosure of a bronchopneumonia and a parenchymatous diffuse nephritis. The bacteriologic examination of the organs showed the presence of the pneumococcus in the lungs. The other organs were sterile.

The third of the three cases was a female aged 2½ months. This child entered the sanitarium August 5 and died August 29. The mother of the child had been in an insane asylum with puerperal insanity since the birth of the infant, and the child had been fed on Mellin's food up to the time she came under observation. The temperature course was of a septic character, ranging from 98 to 106 F. (Chart 4), averaging about 101 degrees. The bowel movement ran up as high as ten, with an average of six. Vomiting was present, but was not of frequent occurrence. Mouth lesions were constantly present. The differential blood count was as follows: Small lymphocytes 35 per cent., large lymphocytes 15 per cent., neutrophiles 47 per cent., eosinophiles 1 per cent., and myelocytes 2 per cent. Repeated Widal tests were positive. The bacteriologic examination disclosed the specific trouble to be typhoid. The bacteria of the throat were colon bacilli, sarcinæ, and pneumococci three varieties. The bacteria of the stools were colon bacilli, a red pigmenting bacillus of the colon group, typhoid bacilli, sarcinæ, pneumococci and streptococci, six varieties altogether. A postmortem was not obtainable.

The last of the severe cases was a female aged 7½ months. This child came under observation July 22, and died August 5, fifteen days after entering. In this case there also ran a septic temperature which varied from 98 to 104 degrees. Bowel movements were frequent, once reaching fifteen during twenty-four hours. Vomiting occurred only twice and was not severe. No mouth lesions were present. The blood examinations were not made. The bacteriologic examination of the throat was also omitted. One bacteriologic finding in the stools makes this case worthy of notice. There was found a red pigmenting bacillus of the colon group that developed a red pigment so rapidly in the intestines that the feces and mucous secretions were stained blood red. Several bloody stools were recorded and twice the nurse in charge reported a hemorrhage from the bowels, but no blood was found on microscopic examination. A full description of the pathogenesis of this bacillus has not been furnished me, but the clinical significance of such a finding is worthy of some comment. An autopsy was not allowed in this case.

As a result of the examination of the above cases, the histories of which have been briefly reviewed, some general deductions may be made regarding the etiology, symptomatology and treatment of summer diarrheas of children. It will be remembered that Booker, in 1897, made the statement that no single micro-organism is found to be the specific exciter of summer diarrhea of infancy, but the affection is generally to be attributed to the results of the activity of a number of varieties of bacteria. While generally speaking, the statement is undoubtedly true, however, it does seem possibly and probably true that some of the well-known pathogenic organisms, such as the typhoid bacillus, pneumococcus and streptococcus, gain entrance to the general circulation through lesions in the gastro-intestinal tract, and give rise to septicemia, and are the immediate cause of death; that these atria of infection are produced by the local action of less toxic micro-organisms, such as staphylococcus, colon bacillus, yeasts, and thrush fungus; and that the toxins which are generated by the saprophytic action of all of the micro-organisms in the intestines, tend both to lower the resistance of the child and to mask the symptoms of the specific intoxication. It is further apparent that the increased frequency of vomiting and bowel movement is more often due to the reflex action of septicemia and sapremia than to direct intestinal irritation; and that the gross appearance of blood in the stools should always be corroborated by a microscopic and bacteriologic examination.

Finally, if the above conditions of sepsis and sapremia be true in these cases, then the problem of treatment resolves itself into a question of maintaining the general resistance of the child and of neutralizing the specific intoxication by such means as prophylactic cleanliness, nutritious diet, frequent enemas to keep up the balance of body fluid, quinin inunctions as a general tonic, and keeping the child out of doors on a firm bed, instead of on a luxurious crib or cab in a stuffy, hot room.

I wish to acknowledge valuable assistance rendered me in this work to Drs. J. J. Gill and W. G. Baine.

DISCUSSION.

DR. M. MICHAEL, Chicago, said that with Dr. Coone and Dr. Weaver he undertook the study of 97 cases of summer diarrhea in children. Dr. Weaver took up the bacteriologic side of the question, and Dr. Coone and Dr. Michael the clinical. For collecting the stools a sterile wide-mouthed bottle partly filled with salt solution was used; this was tightly corked and two glass tubes were passed through the cork. One was stuffed with cotton and to the other was attached a rubber tube and to the end of this a catheter. The catheter was protected by a second tube in order to keep it sterile until inserted into the bowel. The apparatus was turned upside down and the second tube was gradually drawn back as the catheter was inserted. When the salt solution had run into the bowel the apparatus was turned down again and the stool passed through the catheter into the bottle. This was carried to the laboratory, and the Memorial Institute for Infectious Diseases of Chicago furnished the material for bacteriologic study. The dysentery bacillus was found in about 24 cases. Clinically the 97 cases could fairly well be divided into two groups. In the first group the toxemic symptoms predominated. There was high temperature, nausea, vomiting, restlessness, great nervousness and the children were very ill. In the second group the local symptoms predominated, the picture being one of ileocolitis. In these cases the stools contained much mucus and blood. The dysentery bacillus was found in the cases in which the stools did not show blood and in those in which the blood and mucus were found, but it did not occur in all the latter cases. They found also that cases of ileocolitis in which the dysentery bacillus was found did not differ in any way from those in which the bacillus was not found.

DR. ARTHUR W. FAIRBANKS, Boston, stated that Dr. Cook's remarks may explain an experience a few years ago in a small hospital in Boston where they have a great many cases of very severe ileocolitis. The nurse reported that blood appeared in the stools of a patient, and Dr. Fairbanks directed the house officer to hunt with the microscope for blood, but it was not found. Later he saw one of the stools and it had the appearance of streaks of blood through it. He then requested the house officer to make the hematin test. The house officer reported that there was no positive reaction, and Dr. Fairbanks inclined to question the accuracy with which the test was made, but this bacillus mentioned by Dr. Cook, he thinks, may explain the occurrence.

DR. J. C. COOK said that he was glad to have Dr. Michael give the method of collection. Good work was done by her and her colleagues and a valuable report made of it. The bacillus has been examined in a number of laboratories and has shown some peculiarities of growth and development; whether or not it is pathogenic is not yet known. It is believed to belong to the colon group. There is no literature on the subject so far as Dr. Cook has been able to find. It appeared twice in his experience and the quantity of blood or stain was so great that it might easily be mistaken for a hemorrhage of the bowels when there was no blood or ulceration present. In reply to a question Dr. Cook stated that it was a fatal case, and that he, perhaps, did not make very apparent the relation of the vomiting to the rise of temperature. The vomiting and bowel movements were very likely to occur together or within a few hours of one another, showing the condition of sepsis that might induce them rather than any bowel irritation. These children were for the most part fed after the most approved method.

Variable Liver.—Professor Mongour of Bordeaux has noticed that in malaria the liver is liable to vary in size from day to day. These variations seem to be proportional to the resisting powers of the organ. The prognosis of any acute or chronic hepatitis is better the greater the range and frequency of these changes in the size of the liver. In some cases the organ will seem to be atrophied one day and hypertrophied the next. He has recently called the attention of the Paris Academy of Medicine to the matter.

THE ANTI-MICROBIC ACTION OF IODIN.*

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CHICAGO.

PREFACE.

The uniform satisfaction given by the iodin catgut prepared after the method of Claudius,[1] which has been used by Dr. Nicholas Senn in his clinical work, led him to employ a solution of iodin for irrigation in infected wounds and also for hand sterilization. The results obtained demonstrated, clinically, the marked potency of iodin in solution as an antiseptic. Its continued use for several years has shown it to be far superior to any antiseptic previously employed.

In order to determine the absolute value of this solution, a series of experiments have been carried out on a number of different micro-organisms *in vitro*. A sufficient number of different organisms and a great number of tubes have been used. Therefore one is justified in assuming that the conclusions arrived at from a careful study of the series of experiments represent as nearly as possible the position of iodin in the family of antiseptics. When we try to make an accurate comparison between the members of this numerous family, however, we find we can not do so because of the widely different methods of procedure employed by the different investigators. In addition, the majority of the methods show one or more points of possible error. Not for the purpose of comparison, but with the idea in view of presenting the experimental findings of various men on the more important antiseptic substances, there has been incorporated in this research a short bibliography of antiseptics in general.

Bichlorid of Mercury.—Kyle[2] found that it took 1/1000 solution bichlorid ten hours to insure no growth of tetanus bacillus. Koch[3] determined that a 1/20000 solution killed anthrax spores in ten minutes. Klein,[4] however, found that anthrax spores were not influenced by a 1/10000 solution acting for one hour. Evans,[5] from experiments on *Bacillus anthracis* in liquid media, reported that a 1/15000 for one minute and a 1/20000 for thirty minutes were effective. In regard to the spores he found that a 1/1000 for fifteen minutes and a 1/1500 for an hour were effective. Likewise, a 1/1000 for five minutes gave growth. On *Staphylococcus pyogenes aureus*, the same author states that a 1/200 solution for fifteen minutes killed, while a 1/250 solution for one hour impaired vitality. Tarnier and Vignal,[6] using thread method of Koch, found that a 1/1000 solution for two minutes killed both *Streptococcus* and *Staphylococcus pyogenes aureus*. Harrington,[7] employing the same method, states that where the threads are moist an exposure of over fifteen minutes to a 1/1000 solution is necessary to kill the *Bacillus pyocyaneus*, while if threads are dry five seconds are sufficient. On *Staphylococcus aureus*, either on moist or dry threads, from five to ten minutes kills. On *Bacillus anthracis*, either dry or moist threads, an exposure to a 1/1000 solution for thirty minutes has no bactericidal effect. Hence, he states that bichlorid of mercury is a greatly overrated disinfectant. Burgess,[8] who also used the thread method in his experiments on *Bacillus coli communis*, found that a 1/750 solution for one minute was effective, as were a 1/2000 solution for five minutes and a 1/7500 for ten minutes. Sternberg,[9] from experiments on gonococcus, states that 0.005 per cent. bichlorid solution for two hours kills. He concludes that in bichlorid we have a germicidal agent of the highest value.

Carbolic Acid.—Kyle[2] found that the tetanus bacillus had to be exposed to a 5 per cent. carbolic acid solution for six hours in order to assure no growth. Cabbot,[10] on adding 5 per cent.

* Work done as Fellow in Surgery at the Senn Laboratory, Rush Medical College.

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2. Kyle: Therapeutic Gazette, Detroit, 1892, vol. viii, p. 163.
3. Koch: Mitthellungen aus dem k. Gesundheitsamte, vol. i, 1881.
4. Klein: Local Gov. Bd. Rep., London, 1885-6.
5. Evans: Guy's Hospital Report, London, 1890, 3 s., vol. xxxii, pp. 195-232.
6. Tarnier and Vignal: Arch. de méd. expér. et d'anat. path., Paris, 1890, vol. ii, p. 477.
7. Harrington: Boston Medical and Surgical Journal, 1903, vol. cxlviii, pp. 445-439.
8. Burgess: Lancet, London, 1900, vol. i, p. 1798.
9. Sternberg: American Journal of Medical Science, 1883, vol. lxxxv, pp. 321-343.
10. Cabbot: Boston Medical and Surgical Journal, 1879, vol. ci, p. 75.

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carbolic acid to a putrefactive solution and then transferring several drops of mixture to an aseptic medium, discovered that after five seconds' exposure no putrefaction occurred in fresh tubes. Evans[9] found that on anthrax bacillus a 1/100 solution for five minutes, 1/150 solution for fifteen minutes, and a 1/175 solution for thirty minutes, were effective. On the spores, he got a growth after four hours' exposure to a 5 per cent. solution. A twenty-four hours' exposure, however, was sufficient to insure no growth. A 1/40 solution on *Staphylococcus aureus* for fifteen minutes gave no growth. Burgess,[5] in his work on *Bacillus coli communis*, states that a 10 per cent. solution kills in one minute, a 2.5 per cent. in five minutes, a 1 per cent. in thirty minutes, and a 0.75 per cent. in one hour. Blyth[11] found that a 1-10 per cent. solution for four hours had no effect on anthrax spores. A twenty-four-hour exposure, however, proves deficient. He used the glass-rod method. On the gonococcus and micrococcus of abscess pus, Sternberg[7] found that the action of an 0.8 per cent. solution for two hours killed the organisms.

Alcohol.—From experiments on the germicidal effect of alcohol, Harrington[12] concludes: "Alcohol of any strength has absolutely no effect on anthrax bacillus; 60 to 70 per cent. alcohol is the most efficient strength against non-spore forming bacteria, i. e., *Staphylococcus pyogenes aureus* and *albus*, typhoid bacillus, bacillus of diphtheria, being usually effective in five minutes."

Salzwedel and Elsner,[13] using thread method, state that 55 per cent. (by weight alcohol) was most effective in staphylococcus pus, requiring in fresh pus from five to six minutes to be effective. They state that this solution is not quite equal to a 1/1000 solution of bichlorid, but is as efficient as a 3 per cent. carbolic solution. Sternberg[7] found that with a two-hour exposure, a 95 per cent. alcohol was fatal to gonococci, while a 40 per cent. solution did the work on the micrococcus of abscess pus.

Hydrogen Peroxid.—In his work on the tetanus bacillus, Kyle[4] states that after a forty-eight-hour exposure to hydrogen peroxid the bacilli still grew. On the other hand, Gibier[14] finds, from experiments he has made with a 3.2 per cent. hydrogen peroxid solution in water on *Bacillus anthracis, Bacillus typhosus, Streptococcus pyogenes*, etc., that after some minutes of contact (exact time not stated) the bacteria could not be cultivated from bouillion, hence were destroyed.

Formaldehyd.—Shaw[15] determines that a 1/2000 solution of formaldehyd broth prevented the growth of *Bacillus pyocyaneus*. Pottevin[16] finds that 5 centigrams of formaldehyd to a liter of bouillon stops growth of *Bacillus diphtheriæ, pyocyaneus, typhosus* and the *Staphylococcus pyogenes aureus*. Burgess[5] concludes that on *Bacillus coli communis*, a 1/30 solution is destructive in one minute, a 1/50 solution in five minutes, and a 1/150 solution in thirty minutes.

Lysol.—Burgess,[5] who included lysol in his experiments on *Bacillus coli*, found that a 1/10 aqueous solution killed it in one minute, a 1/30 solution in five minutes, a 1/250 solution in thirty minutes and a 1/300 solution in one hour.

Boric Acid.—Burgess[5] also found that a saturated solution of boric acid was entirely wanting in antiseptic powers, no matter how long the exposure. Sternberg[7] came to a like conclusion from his work on gonococcus and micrococcus of abscess pus.

Phenic Acid.—On streptococci and staphylococci Turnier et Vignal[3] state that a 3 per cent. aqueous solution of phenic acid is efficient in seventeen minutes, a 2 per cent. solution in eighteen minutes. Chamberland,[17] from his experiments, finds that anthrax bacilli are killed by a forty-eight-hour exposure to a 1/400 solution of phenic acid.

Salicylic Acid.—A 1/240 solution of salicylic acid for three minutes kills putrefactive organisms, according to Cabbot.[18]

Methyl Violet.—Stilling,[19] as his findings from experiments, states that methyl violet is three times as strong as bichlorid in its action on anthrax bacillus and quite as effective as it on staphylococcus pyogenes aureus.

Nicotin.—Herbert,[20] reviewing the work of Pécholier (1883) on the action of nicotin in alcoholic solution on bacteria: that of Vincent Tassinari de Pise (fumes of tobacco in 1888); and that of Vissalli (fumes of tobacco in 1888); and from added experiments of his own (nicotin in alcohol solution), says in conclusion that "nicotin does not appear gifted with very powerful antiseptic properties for 1/3 of a drop (sufficient to kill a pigeon in a few seconds) does not prevent the development of certain bacteria in 3 c.c. of bouillon." But he coincides from experiments of Tisdall on bacillus and spirillum of Asiatic cholera, and from his own on bacillus diphtheria that it attenuates the virulence of microbes. Junor[20] reports a case of tetanus cured by local application of infusion of tobacco.

Mercuric Cyanide.—Harrington,[12] using the thread method, found that a 1/1000 solution of mercuric cyanid had no effect in thirty minutes to kill *Staphylococcus pyogenes albus*, while a three-hour exposure on *S. aureus* showed no antiseptic effect. Hence it is impractical.

Radium.—It was found by Van Buren,[22] from his experiments on *Bacillus typhosus, Bacillus pyocyaneus* and *Staphylococcus pyogenes aureus*, that radium, acting from eight to thirteen hours, was negative in antiseptic action. Pfeiffer[23] also shows its negative action on *Bacillus typhosus* and the cholera spirillum.

Collargol.—Forteseque-Brickdale[24] states "in solution of 0.5 per cent. and under, collargol has no bactericidal effect on *Streptococcus pyogenes* or *Staphylococcus pyogenes aureus* after a twenty-four-hour exposure to a one-day-old culture. (Plate Method.)"

Turpentine.—Marx[25] found that it required 1/500 turpentine acting for an hour to hinder the growth of anthrax. Forty minutes was required for *Staphylococcus pyogenes aureus*.

Glycerin.—Copeman,[26] from numerous experiments, fully covered by controls, on *Staphylococcus pyogenes aureus* and *albus, Streptococcus pyogenes, Bacillus anthracis, subtilis, coli communis, pyocyaneus, diphtheriæ*, and *tuberculosis* determines: "(1) No visible development of organisms employed takes place in presence of more than 30 per cent. glycerin in beef peptone broth; (2) all organisms, except coli and subtilis, are killed in less than one minute in the presence of 30 per cent. to 40 per cent. glycerin in the cold."

Potassium Permanganate.—According to Cabbot,[18] a 1/960 aqueous solution of permanganate potassium requires over six minutes to stop putrefaction in a putrefactive solution. Sternberg[7] found that 0.12 per cent. permanganate acting on gonococcus and micrococcus of abscess pus destroyed them.

BIBLIOGRAPHY OF ANTISEPTICS CONTAINING IODIN IN CHEMICAL COMBINATION.

Biniodid of Mercury.—On the *Staphylococcus aureus* and the *Streptococcus*, Tarnier and Vignal[3] have shown that a 1/1000 solution of biniodid of mercury is destructive in nine minutes; a 1/2000 solution in twenty-two minutes. On *Bacillus coli communis*, Burgess[5] states that "biniodid of mercury is by far the strongest and best antiseptic (of the ones he tried), and it is not affected by albumin." In his table he places 1/1000 solution effective in one minute; 1/5000 in five minutes; 1/20000 in ten minutes; 1/80000 in thirty minutes; 1/200000 in one hour.

Lithio-Mercuric Iodid.—Rosenberger,[27] working with lithio-mercuric iodid (34 per cent. mercury, 65 per cent. iodin, 1 per cent. lithium) and using thread method, found that on *Staphylococcus pyogenes aureus*, when threads were moist, 1/1000 solution for thirty seconds killed; 1/5000 for one minute did the same. When threads were dry, 1/1000 for one minute killed; likewise 1/5000 for three minutes. On *Streptococcus pyogenes* (dry threads) 1/1000 for thirty seconds killed; 1/5000 for thirty seconds killed; threads moist, 1/1000 for thirty seconds was effective; 1/5000 required two minutes. On anthrax bacillus 1/1000 solution was necessary for fifteen minutes when threads were dry, and for thirty minutes when moist threads were used. He concludes that this is a much more powerful germicide than the usual mercuric salts.

Iodoform.—The experimental results differ greatly from the clinical. A great deal of experimental work has been done on iodoform. Its action has been tested on various organisms by numerous investigators, and their findings seem to indicate that it possesses no bactericidal properties of any moment. The men who have so determined are Hevn and Rovsing,[28] Riedlin,[29] Baumgarten,[30] Kronacher,[31] Buchner,[32] Kunz,[33] Schnirer,[34] Lubbert,[35] and Tilanus.[36] On the other hand, the work

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30. Baumgarten: Berliner klinische Wochenschrift, 1887, Bd., vol. xxiv, p. 354.
31. Kronacher: Münchener med. Wochenschrift, 1887, vol. xxxiv, p. 545.
32. Buchner: Munchener med. Wochenschrift, 1887, vol xxxiv, p. 465.
33. Kunz: Arbeiten a. d. Pathologische Institut Zu Konisberg, 1887.
34. Schnirer: Wiener medicin. Presse, 1887, Nos. 36-38.
35. Lubbert: Fortschritte d. medicin, Bd. V, 1887, pp. 330-345.
36. Tilanus: Munchener medinische Wochenschrift, vol. xxxiv, p. 309.

of Mikulicz,[37] who, on adding iodoform to putrefying liquids, saw putrefaction sometimes stopped and sometimes to continue; that of Maylard,[38] who states that it retards but does not stop the development of anthrax bacillus; and that of Stohegoleff,[39] who found that tubercle bacilli inoculated on 5 per cent. iodoform bouillon were dead in forty-eight hours, seems to indicate that under certain conditions (i. e., where free iodin is eliminated) it has a slight antiseptic value.

Clinically, when the iodoform comes in contact with tissues, more free iodin is eliminated, hence the results are much better than experiments would indicate. Its use in tubercular joint injections needs no comment. Vinke[40] reports favorably in two cases of anthrax dressed with iodoform. Sormani[41] found by wounding rabbits and guinea-pigs and injecting them with tetanus bacilli and then treating them with different antiseptics that iodoform was the most active of all, and if applied at once tetanus did not appear. Pryor[42] reports thirty-seven cases of puerperal sepsis with but four deaths treated by packing uterus and widely opened cul-de-sac with iodoform gauze, free iodin being liberated and shown to be present in the urine.

Iodin.—The antiseptic action of iodin was discovered by Davaine[43] in 1873. He found that a 1/12000 solution caused the virulence of anthrax to disappear in thirty minutes. Tarnier and Vignal,[9] in their work on *Staphylococcus pyogenes aureus* and *Streptococcus pyogenes*, found that a 1/1000 solution of potassium iodid required over an hour to kill, a 1/500 solution required fifteen minutes, and a 1/300 solution required eight minutes. White[44] states that he has made a number of tests and observed that "in strength of 1/1000 iodin solution in bouillon no growth of streptococcus occurs. *Staphylococcus aureus* will not grow in strength of 1/5000." Davaine[45] determines that a 1/170000 solution of iodin in contact with anthrax blood for fifty to sixty minutes renders it harmless to inject into guinea-pigs. Sternberg[2] states that a 0.2 per cent. solution destroys gonococcus acting for two hours. Claudius,[1] in his article describing his method of sterilizing catgut by immersing in a solution of one part iodin, one part potassium iodid, and water one hundred parts, for eight days and then transferring to 3 per cent. carbolic acid to rinse off excess of liquid iodin, remarks that from his experiments he has found that a 1 per cent solution kills *Staphylococcus aureus* in three minutes and anthrax in twenty hours. He states further that such a long contact is unnecessary (1/5000 solution kills anthrax spores in a short time).

Clinically, iodin solutions have been used with excellent results in treating anthrax. Sereins[46] reported two cases of anthrax cured by injecting a 1/100 solution around and into pustule. Brochin[47] has also reported two cases successfully treated by the same method. Human actinomycosis has been cured by the daily injection of 2 c.c. of a 10 per cent. iodin solution, as shown by Gaucher.[48]

37. Mikulicz: Langenbeck's Arch'v., vol. xxvii, pp. 196-239.
38. Maylard: Annals of Surgery, 1890, vol. xi, pp. 17-33.
39. Stchegoleff: Arch. de méd. expér. et d'Anat. Path., 1894, vol. vi, pp. 813-837.
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41. Sormani: Riforma Medica, 1890, January, pp. 11-13.
42. Pryor: New York Medical Journal, 1903, vol. lxxviii, p. 356.
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47. Brochin: Gaz. d. hôp., Paris, 1880, vol. liii, p. 1010.
48. Gaucher: Ann. de Derm. et Syph., 1903, 4 S., vol. iv, p. 837.

In concluding the bibliography, it is only necessary to call attention to the great number of different substances employed as antiseptics to show that, as yet, the ideal germicide is a negative quantity.

TECHNIC OF EXPERIMENTAL RESEARCH.

Solution Employed.—A solution of iodin in sodium iodid and water was prepared after the following formula:

Iodin, gms.	2.5
Sodium iodid, gms.	5.5
Aqua (sterilized)	250 cc.

This gave a 1/100 solution. From this solution, by aqueous dilution, strengths of 1/200, 1/300, 1/500 and 1/1000 were made. In preparing the mother solution, accuracy was observed in weighing the iodin and sodium iodid. The same care was followed in making dilutions. The glass containers were sterilized.

Asceptiicity of Solutions.—The varying strengths of solutions were now tested to see whether or not they were, of themselves, sterile. For this purpose the plate method was employed. Three drops of solution were used to inoculate a melted agar tube from which a plate was made. From each strength solution three plates were made. After incubating six days every plate was free from colonies, hence sterile. To confirm results inoculations from the different strengths were made on 6 per cent. glycerin potato and incubated six days. The result was again negative in character.

METHOD OF CONDUCTING EXPERIMENTS.

In conducting the several series of experiments, an effort was made to employ a method which would offer the minimum possibility of error, and, at the same time, approach, as nearly as possible, to the exact relation of bacteria to the body in disease. In other words, the media employed were solid in every case, and the growths on them were allowed to become marked, both in extent and thickness, before beginning experiment. Thus, by the thickness of the growth, the penetrating power of the liquid could be ascertained.

The microörganisms on which the action of the iodin solutions was tried were various enough to permit of definite deductions being made from the results on the antimicrobic action of iodin. These microörganisms were: (1) *Bacillus prodigiosus;* (2) *Bacillus anthracis* and spores; (3) *Bacillus tuberculosis;* (4) *Staphylococcus pyogenes aureus;* (5) *Streptococcus pyogenes;* (6) *Blastomyces dermatidis;* (7) *Actinomyces bovis.* On these various growths in the test tubes, the iodin solutions were deposited by means of a sterilized pipette until the surface of the growth was completely covered. After varying periods of time, which are designated in the tables, small loops of growth, thus acted on, were transferred to tubes of sterile media and well inoculated, and then put in incubator and watched for growth. No effort was made to wash the inherent iodin solution from the loops because of the danger of washing away the bacteria. For each time of exposure, four tubes were used, each one being covered by a control tube. It is well to note that the bacterial growths transferred were macroscopic and not microscopic in size.

EXPLANATION OF TABLES.

A, B, C, D=Tubes to which bacteria, acted on by solution, were transferred.

A', B', C', D'=Control tubes inoculated with original healthy bacteria. The figures are based on the use of the unit 1 as the denominator of growth, being purely arbitrary and used for sake of comparison. It refers to the transverse extent

of growths from smear and equals about ⅛ of an inch. 2=twice the denominator, 3=three times the denominator and so on.

0=No growth.

?=Slight growth, but not equal to 1-32 inch.

Time=Figures designating days of growth, i. e., Figure 1 means growth on first day or 24 hours after inoculation. Figure 2 means growth on second day or forty-eight hours after inoculation, and so on.

The strength of solution and time of exposure are designated in each table.

ANTHRAX EXPERIMENTS.

The following tables (Group 1) show the results of the experiments with anthrax cultures:

GROUP 1.—ACTION OF SOLUTIONS ON BACILLUS ANTHRACIS PLUS SPORES (TWO-DAY-OLD CULTURES*).

TABLE 1.—IODIN 1-1,000. EXPOSURE 15 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	.2	1.5	1.5	1.5	1.5	1.5	1	1.5
2	.5	2.5	2.5	2.5	2	2.5	2.5	2
3	2	3.5	3.5	3.5	2.5	3	2.7	3.2
4	4	4	4	4	3	3.5	3.5	3.5

TABLE 2.—IODIN 1-1,000. EXPOSURE 30 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	1.2	1.5	1.5	1.5	2.2	2	1	1.5
2	2	2.5	2	2	2.5	2.2	2	2.5
3	3	3.5	3	3	3.5	3	3	2.7
4	4	3.6	3.5	3.5	4.5	3.5	4	3

TABLE 3.—IODIN 1-1,000. EXPOSURE 60 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	.2	2	.2	2.2	0	1.2	0	2
2	.2	2.5	.2	2.7	0	2.5	0	3
3	.2	3.5	.5	4	?	3.5	0	4
4	.3	4.5	1	5	.6	4.5	?	5

TABLE 4.—IODIN 1-500. EXPOSURE 15 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	0	1.5	.2	1	0	1	?	1
2	.2	2.5	.3	2	0	1.5	.7	2
3	.7	3.5	1	3.5	?	2.5	.7	2.5
4	2	4.5	2	4.5	.5	3.5	2	3.5

TABLE 5.—IODIN 1-500. EXPOSURE 30 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	0	1	0	1.5	0	1.5	0	1
2	?	2	0	2.5	0	2.7	?	2
3	.2	3	0	2.5	0	3.5	?	3
4	1.7	4	?	4.5	0	4	.5	4

TABLE 6.—IODIN 1-500. EXPOSURE 60 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	0	1.5	0	1	0	.7	0	1
2	0	2.5	0	2	0	1.7	?	2
3	?	3.5	0	3	?	2.5	?	3
4	.2	4	0	3.5	.1	3	?	3.5

TABLE 7.*—IODIN 1-300. EXPOSURE 15 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	?	1	?	2.5	?	1.5	0	2.5
2	.5	2.2	?	3	?	2	0	3.5
3	1.5	3	.5	4	.1	3.5	0	4
4	2	3.5	1	4.5	.2	4	0	4.5

TABLE 8.—IODIN 1-300. EXPOSURE 30 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	0	1.5	0	2	0	1.5	0	1.5
2	?	2.5	0	2	?	2.5	?	2.5
3	?	3.5	?	3	.3	3.5	?	3
4	?	4.5	?	4	.7	4	?	3.5

TABLE 9.—IODIN 1-300. EXPOSURE 60 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	0	1	0	2	0	1.5	0	2
2	0	2	0	2.5	?	2	0	2.2
3	.1	3	0	3.5	?	3	0	3
4	.3	3.5	0	4	?	3.5	0	4

TABLE 10.—IODIN 1-200. EXPOSURE 15 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	0	1	0	1.5	0	1.2	0	1.5
2	0	2.5	.3	2.5	0	2.2	.7	2.5
3	0	3.5	1	3	0	2.7	1.3	3
4	0	5	1.7	4	?	3.5	2	3.5

TABLE 11.—IODIN 1-200. EXPOSURE 30 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	0	1.5	0	1	0	1.5	0	1
2	.2	3	0	2.5	0	2.5	0	1.5
3	.5	4	0	3	0	3.5	?	3
4	.7	4.5	0	4	0	4	?	3.5

TABLE 12.—IODIN 1-200. EXPOSURE 60 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	0	1	0	1.5	0	1	0	2.5
2	0	2	0	2.5	0	2.2	0	3.5
3	0	2.5	0	3	0	3	0	4
4	0	3	0	4	0	3.5	0	4.5

TABLE 13.—IODIN 1-100. EXPOSURE 15 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	0	1.3	0	1	0	1	0	1.5
2	0	2.7	0	2.5	0	2.5	0	2.5
3	0	3.5	0	3	0	3	0	3.5
4	0	4	0	3.5	0	3.5	0	4

TABLE 14.—IODIN 1-100. EXPOSURE 10 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	0	1.5	0	1	0	1.3	0	1
2	0	3	0	2.5	0	3	0	2.5
3	0	4	0	3.5	0	4	0	3
4	0	4.5	0	4	0	4.5	0	3.5

TABLE 15.—IODIN 1-100. EXPOSURE 9 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	0	1.5	0	2	0	1.5	0	1
2	0	2.5	0	3	0	3	0	2
3	.1	3.5	0	4	0	3.5	0	3
4	.2	4.5	0	4.5	0	4	0	3.5

TABLE 16.—IODIN 1-100. EXPOSURE 8 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	0	2	0	1.5	0	2	0	1.5
2	?	3	0	2.5	0	3.5	0	3
3	.7	4	?	3	0	4	.2	3.5
4	1	5	?	4	0	5	.5	4

TABLE 17.—IODIN 1-100. EXPOSURE 7 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	0	2	0	2	0	1.5	0	1.5
2	?	3	1	3.5	?	2.5	?	2.5
3	.5	4	1.3	4	.1	3.5	.3	3
4	1	5	1.5	5	.3	4	.5	3.5

CONSIDERATION OF EXPERIMENTAL EVIDENCE ON ANTHRAX.

1/1000 for *fifteen* minutes is negative in action.

1/1000 for *thirty* minutes is negative in action.

1/1000 for *sixty* minutes shows an inhibitory effect. On first day A and C give 1/10 of control growth, while B and D show no growth. On second day there is no further development. The third day A shows no further development, B, a slight one, C shows points, and D, no growth. On the fourth day A, B, and C show a further development equaling 1/10 control growth, while D shows points.

1/500 for *fifteen* minutes exhibits an inhibitory effect. The first day A and C give no growth, B one equaling 1/3 control growth, and D, a very slight one. On second day there is a slight increase, A. B, and D showing small fractional growths, C being free from growth. On third and fourth days the increase is progressively more rapid, equaling about ½ control growth on latter day.

1/500 for *thirty* minutes gives a marked inhibitory effect. First day there is no growth. On the second day A and D each show a point, while B and C are free from growth. On the third day B and C still remain without growth, A and D showing a very slight increase. The inhibition is still extremely marked on the fourth day, A and D exhibiting a fair increase in growth, equaling about ¼ control, C remaining free from growth and B showing one point.

1/500 for *sixty* minutes shows a very marked inhibitory effect. On the first day there is no growth. On the second day D shows one point, while others are free from growth. On the third day effect still continues, A, C, and D showing points, B, free from growth. This continues the fourth day, A and C showing increase, equaling 1/16 of control growth, B is free from growth, D shows points of growth.

1/300 for *fifteen* minutes shows an inhibitory effect. D shows no growth throughout. On first day the rest show points. On second day there is a very slight increase. On third and fourth days there is a gradual increase, equaling about ¼ control at end.

1/300 for *thirty* minutes exhibits a marked inhibitory effect. On first day there is no growth. The second day points appear on A and D, B is free from growth, and C shows a slight one. On the third and fourth days A, B, and D show no increase in points. C shows a small fractional increase.

1/300 for *sixty* minutes presents a very marked inhibitory effect. B and D show no growth throughout. On the second day a very slight growth appears on C which does not increase on third and fourth days. On third day a very small fractional growth appears on A which increases slightly on fourth day.

1/200 for *fifteen* minutes shows a marked inhibitory effect. A is without growth throughout. On first day there is no growth. On second day B and D show fractional growth which increases rapidly on third and fourth days equaling about ½ control growth. On fourth day a very slight growth appears on C.

1/200 for *thirty* minutes exhibits a very marked inhibitory effect. B and C are without growth throughout. D is without growth until third day when a point appears which does not increase on the fourth day. On the second day a small fractional growth appears on A which increases slowly on remaining days, equaling 1/6 control growth on fourth day.

1/200 for *sixty* minutes shows no growth throughout.

1/100 for *fifteen* minutes shows no growth throughout.

1/100 for *ten* minutes shows no growth throughout.

1/100 for *nine* minutes shows a very marked effect. B, C, and D are without growth throughout. On A there appears on third day a very small fractional growth which increases very slightly on fourth day.

1/100 for *eight* minutes shows a marked inhibitory effect. On first day there is no growth. On second, points appear on A, while B, C and D are free from growth. On third

* All two day-old cultures except in Table 7.

day A and D show fractional growths. B gives a point and C is free from growth. On fourth day A and D increase slowly, equaling about 1/7 control growth. C is without growth and B shows no increase in growth.

1/100 for *seven* minutes exhibits a marked inhibitory effect. The first day there is no growth. The second day shows points on A, C and D, while B equals 1/3 control growth. On third and fourth days there is a fractional growth which increases slightly, equaling 1/6 control growth.

SUMMARY OF EVIDENCE ON ANTHRAX.

Considering first the strength of solution and time of exposure to same necessary to produce the death of *Bacillus anthracis* plus spores, the evidence shows that a 1/200 solution for one hour or a 1/100 solution for ten minutes procures death. An exposure to a 1/100 solution for less than ten minutes gives a growth. The second consideration or the inhibitory effect, depending as it does on the two factors, i. e., time of exposure and strength of solution, first shows itself after an exposure of the organism to a 1/1000 solution for sixty minutes. The inhibitory effect is marked. The effect is also shown by an exposure of fifteen minutes to a 1/500 solution, but to a lesser degree. As the time of exposure is increased, the inhibitory effect becomes more and more marked. Likewise, as the strength of solution employed is increased, the inhibitory action becomes progressively more powerful. If, after the death point is reached, we decrease the time of exposure, we again come into the sphere of diminishing inhibition.

SUMMARY OF EVIDENCE ON PRODIGIOSUS.

The details of the experiments with prodigiosus cultures are as follows (Group 2):

1/500 for *thirty* minutes shows an inhibitive effect, the experimental growth equaling less than ½ control growth the first day. This effect becomes gradually less on second day. By fourth day control and experimental tubes are practically identical in amount of growth.

1/500 for *sixty* minutes shows an inhibitive effect on A, B, and C, the experimental growth equaling 1/7 control growth the first day. D is negative in action. From second day control and experimental growths are identical in extent.

1/300 for *fifteen* minutes shows an inhibitive effect, the experimental growth equaling 1/10 control growth the first day. This effect becomes gradually less until by the fourth day control and experimental tubes are identical.

1/300 for *thirty* minutes shows an inhibitive effect the first day, the experimental growth equaling 1/12 control growth. This effect becomes gradually less until by fourth day experimental and control growths are practically identical.

1/300 for *sixty* minutes shows a marked inhibitory effect first day, the experimental tubes showing a slight growth. This effect became gradually less until by fourth day experimental tubes show 2/3 of control growth. D, however, does not develop.

1/200 for *fifteen* minutes shows a marked inhibitory effect the first day, A, C, and D being negative, B showing slight growth. Marked inhibitory effect continues the second day when all experimental tubes show very slight growth. On third and fourth days the inhibitory effect still continues markedly, A and D showing no further development, while B and C show slight increase, equaling about 1/5 control growth on fourth day.

1/200 for *thirty* minutes shows a marked inhibitory effect. The first day there is no growth. The second day a slight growth appears on A and B, C and D negative. The third day inhibitive effect still continues, A, C, and D showing slight growth, B, marked increase. On the fourth day there is a gradual increase, the experimental tubes showing about 1/6 of growth on control tubes.

1/200 for *sixty* minutes shows a very marked inhibitory effect, A and D being negative in growth throughout. On second day C shows a very slight growth, B, negative. On third and fourth days B and C show gradually increasing growth equaling 1/3 control growth.

1/100 for *fifteen* minutes gives no growth.

GROUP 2.—ACTION OF SOLUTIONS ON BACILLUS PRODIGIOSUS (FOUR-DAY-OLD CULTURES).

TABLE 18.—IODIN 1-1,000. EXPOSURE 15 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	2.5	2.5	2	2.5	3	3.5	3	2
2	3.5	3	3	3.5	3.5	4	4	4
3	4	3.5	4	4	4.5	4.5	4.5	5
4	6	4	4.5	5	5	5	5	6

TABLE 19.—IODIN 1-1000. EXPOSURE 30 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	2	2	2	2.5	2	2.5	2	2.5
2	3	3.5	4	3.5	3	3	3.5	3
3	4.5	4	4.2	4.5	4	3.5	4	4.5
4	5.5	4.5	4.5	5.5	5	4	4.5	5

TABLE 20.—IODIN 1-1,000. EXPOSURE 60 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	2	2	2	3	.5	2.5	1.5	1.5
2	1.5	3	3	4	1	3	2	2
3	2	4	3.5	5	1.5	4	3	2.5
4	2.5	5	4	5	2	5	4	3.5

TABLE 21.—IODIN 1-500. EXPOSURE 15 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	1.5	1	2	2.5	2	2	2	2
2	2.5	1.5	3	3.5	3	3.5	2.5	3
3	3.5	2.5	3.5	4.5	3.5	4	3	4.5
4	4	3	4	5	4.5	4.5	3.5	5

TABLE 22.—IODIN 1-500. EXPOSURE 30 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	.5	1.5	1	2	.2	2	.3	2.5
2	1	2	2	3	2	3	2	3.5
4	2.5	3.5	3.5	4	4	3.5	2.5	4
4	2.5	4.5	4.5	4.5	5	4	3.5	4.5

TABLE 23.—IODIN 1-500. EXPOSURE 60 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	.1	1.5	.3	2	.2	2.5	2	2.5
2	2.5	2.5	3	2.5	2	3.5	3	3
3	3	3	4	3	3.5	4	4	3.5
4	4	3.5	4.5	3.2	4.5	4.5	5	4.5

TABLE 24.—IODIN 1-300. EXPOSURE 15 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	.2	1.5	.2	2	.3	2	.5	2.5
2	2.5	2	?	3	2	2.5	1.5	3
3	?	3	1	3.5	3	4	3	4
4	4	4	3	4	4	4	4	5

TABLE 25.—IODIN 1-300. EXPOSURE 30 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	?	2.5	.1	2	.5	1.5	?	2
2	1	3	2	2.5	2	2.5	1	2.5
3	1.5	4	3	3	3.5	3	2	3
4	2.5	5	?	4	4.5	3.5	4	3.5

TABLE 26.—IODIN 1-300. EXPOSURE 60 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	?	1.5	?	2	?	2	?	2
2	.5	3	?	2.5	.5	3	1.5	2.5
3	2	4	?	3	2.5	4	2.5	3
4	2.5	5	?	3.5	3	5	3	4

TABLE 27.—IODIN 1-200. EXPOSURE 15 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	0	2	?	2.5	0	2	0	2.5
2	?	2.5	?	3	?	4	?	3
3	?	3	.1	3.5	.5	4	?	3.5
4	?	4	.3	4	1.5	4.5	?	4

TABLE 28.—IODIN 1-200. EXPOSURE 30 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	0	1	0	2	0	2.5	0	2
2	?	2	?	3	0	3	0	2.5
3	?	3.5	1	4	?	3.5	?	3.5
4	.5	4	1.5	4.5	?	4	1	4

TABLE 29.—IODIN 1-200. EXPOSURE 60 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	0	2.5	0	1.5	0	2	0	2.5
2	0	3.5	0	2	?	4	0	3.5
3	0	4.5	.2	3	.5	4	0	4
4	0	5	1.5	4	1.5	4.5	0	4.5

TABLE 30.—IODIN 1-100. EXPOSURE 15 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	0	2	0	2.5	0	2	0	2.7
2	0	4	0	3	0	3	0	3.5
3	0	4.5	0	3.5	0	4	0	4.5
4	0	5	0	4	0	4.5	0	5

TABLE 31.—IODIN 1-100. EXPOSURE 10 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	0	3	0	3.5	0	3.5	0	3.5
2	0	3.5	0	4.5	0	4.5	0	4.5
3	0	4.5	0	5	0	5	0	5
4	0	5	0	6	0	6	0	5.5

TABLE 32.—IODIN 1-100. EXPOSURE 9 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	0	2	0	1.5	0	3	0	3
2	0	2.5	0	2.5	0	4	0	3
3	?	4	.7	3.5	?	5	0	3.5
4	?	5	1.5	4	.2	6	0	4

TABLE 33.—IODIN 1-100. EXPOSURE 8 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	0	3	0	2.5	0	2.5	0	3
2	.2	4	.5	3.5	0	3	?	3.5
3	1.5	4.5	2	4	0	3.5	.3	4
4	2.5	5	3	5	0	4	.5	4.5

TABLE 34.—IODIN 1-100. EXPOSURE 5 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	.1	3	.1	2.5	.1	3	.1	2.5
2	2.5	4	2	4	1.5	3.5	2	3
3	3.5	5	3.5	5	4	4.5	3	4
4	4	5.5	4.5	6	4	5	3.5	5

CONSIDERATION OF EXPERIMENTAL EVIDENCE ON PRODIGIOSUS.

1/1000 for *fifteen* minutes is negative in action.

1/1000 for *thirty* minutes is negative in action.

1/1000 for *sixty* minutes shows an inhibitive effect, the experimental growth equaling less than ½ control growth the first day on A and C. This continues relatively the same on remaining days. B and D show no effect.

1/500 for *fifteen* minutes is negative in action.

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1/100 for *ten* minutes gives no growth.

1/100 for *nine* minutes gives marked inhibitory effect. On first and second days there is no growth. On third day points appear on A and C, B shows a fractional growth, D is negative. On fourth day B and C show gradual increase, D, negative, and A showing points of growth.

1/100 for *eight* minutes shows an inhibitory effect. First day gives no growth. C is negative throughout. On second day growth appears which gradually increases up to the fourth day when it equals ¼ control growth.

1-100 for *five* minutes shows an inhibitory effect the first day, the experimental growth equaling 1/15 control growth. On the second, third and fourth days, this inhibitory effect becomes rapidly less. On fourth day the experimental growth is 4/5 control growth.

SUMMARY OF EVIDENCE ON PRODIGIOSUS.

In making a summary of the evidence, there are two factors to be considered: (1) The strength of solution and time of exposure to same necessary to produce the death of the microörganism; (2) the inhibitory action lengthened, and the strength of the solution itself is increased, the inhibitory action becomes more marked until the death point of the germ is reached. And, if we try to decrease the time of exposure necessary to produce death, we reach the inhibitory stage again.

TUBERCULOSIS EXPERIMENTS.

Tuberculosis experiments are detailed in Group 3.

CONSIDERATION OF EXPERIMENTAL EVIDENCE ON TUBERCULOSIS.

1/1000 for *fifteen* minutes shows no effect.

1/1000 for *thirty* minutes shows no effect.

1/1000 for *sixty* minutes shows no effect.

1/500 for *fifteen* minutes shows a slight inhibitory effect the first day. This effect becomes less on the second day and disappears on the third day. Experimental tubes and controls are equal on third and fourth days.

1/500 for *thirty* minutes shows an inhibitory effect the first day, A and B showing ½ control growth, while C gives a point and D is free from growth. This inhibitory effect extends slightly into the second day. On third and fourth days A and B equal control growth, C and D slightly less.

1/500 for *sixty* minutes presents an irregular inhibitory effect. The first day A and D are free from growth, C shows a point, and B equals control growth. The second day the inhibitory effect becomes rapidly less, A and C equaling control growths and remaining equal to the same on the third and fourth days while C and D show a rapid increase in growth which, on third and fourth days, does not increase, equaling less than ½ control growth.

1/300 for *fifteen* minutes shows a marked inhibitory effect the first day, there being no growth. On the second day the growth equals ½ control growth. On the third day the inhibitory effect is still slighter and on the fourth day experimental growth is but slightly less than control.

1/300 for *thirty* minutes shows a marked inhibitory effect. The first day there is no growth. A remains without growth throughout. On the second day growth appears which equals less than ½ control growth. On third and fourth days there is a rapid increase in growth. The experimental tubes equal 2/3 control growth on the fourth day.

1/300 for *sixty* minutes presents a marked inhibitory effect. There is no growth the first day. On the second day A, C,

GROUP 3.—ACTION OF SOLUTIONS ON BACILLUS TUBERCULOSIS (FOUR-DAY-OLD CULTURES).

TABLA 35.—IODIN 1-1,000. EXPOSURE 15 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	4	5	5.5	4.5	5	4	5	5
2	4.5	5.2	5	4.7	5	5.5	4.5	5.5
3	5	5.5	6	5	6	6	5	6
1	5.5	6	6	5.5	6.5	6	5.5	6.5

TABLE 36.—IODIN 1-1,000. EXPOSURE 30 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	4.5	4.5	4.5	4.5	3	4	3	4
2	4.7	5	4.7	5	4	4.5	4	5
3	5	5.2	5	5.5	5	5	5.5	5.5
4	5	5.5	5.5	6	5.5	5.5	6	6

TABLE 37.—IODIN 1-1,000. EXPOSURE 60 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	4.5	5	5	4	5	5	3.5	4
2	5	5.5	5.2	4.5	5	5.2	4	5
3	6	5.7	5.5	5	5.5	5.5	4.2	5.2
4	6.5	6	5.5	5.5	6	6	4.5	5.5

TABLE 38.—IODIN 1-500. EXPOSURE 15 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	1.5	4	3	3.5	2	4.5	2.5	3.5
2	2.5	4.5	4.5	5	3.5	5	3.5	4.5
3	3	4.6	5	5.5	5	5.5	4.5	5
4	3.5	5	5.5	6	6	6	5	5

TABLE 39.—IODIN 1-500. EXPOSURE 30 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	1.5	3.5	2	4	1	4	0	3
2	3.5	4	4	4.5	2.5	5	1	4
3	4	4.5	4	5	3	5.5	2	4.5
4	5.5	5.5	4.5	5.5	4	6	4	5

TABLE 40.—IODIN 1-500. EXPOSURE 60 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	0	3.5	3	5	1	3	0	3.5
2	4	4.5	5	4	2	3.5	2.5	4
3	4.5	5.5	5.5	5	2.2	5	2.5	5
4	5.5	6	6	6	2.5	5.5	2.5	5.5

TABLE 41.—IODIN 1-800. EXPOSURE 15 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	0	4.5	0	4	0	4	0	4
2	1.5	5	4	5	3	5.5	2	5
3	3	5.5	4.5	5	3.5	5.7	3	5.2
4	4	6	5.5	5	4.5	6	5	5.5

TABLE 42.—IODIN 1-800. EXPOSURE 30 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	0	3	0	3.5	0	4	0	3
2	0	3.5	1	4.5	2	4.5	2	3.5
3	0	4.5	2.5	5	4	5	3	4
4	0	5	4	5.5	5	6	4	5

TABLE 43.—IODIN 1-800. EXPOSURE 60 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	0	4	0	3	0	3.5	0	3.5
2	1	4.5	0	3.5	1.5	4	0	4
3	1.2	5	.1	4.5	2	5	3.5	4.5
4	1.5	5.5	.3	5	2.5	5.5	4	5.5

TABLE 44.—IODIN 1-200.—EXPOSURE 15 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	0	4	0	2.2	0	3.5	0	3
2	?	4.5	2	4	.1	4.5	?	4
3	?	5.5	2.5	4.5	.3	5.5	?	5
4	?	6	2.5	5	1.5	6	?	5.5

TABLE 45.—IODIN 1-200. EXPOSURE 30 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	0	3.5	0	3	0	2.5	0	3
2	0	4	0	4	?	3	0	4
3	0	4.5	0	5	.2	4	0	5
4	0	5	?	5.5	.5	5	0	6

* This was watched for a number of days, but no growth appeared on experimental tubes.

TABLE 46.—IODIN 1-200. EXPOSURE 60 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	0	4	0	4	0	5.5	0	3.5
2	0	5	0	4.5	0	4.5	0	4
3	0	5.5	0	4.7	0	5	0	4.5
4	0	6	0	5	0	5.5	0	5

TABLE 47.—IODIN 1-100. EXPOSURE 15 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	0	2	0	3	0	2	0	2
2	0	4	0	4.5	0	4	0	3
3	0	5	0	5.5	0	5	0	4
4	0	6	0	6	0	5.5	0	5

TABLE 48.—IODIN 1-100. EXPOSURE 10 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	0	2	0	2	0	3	0	2.5
2	0	3	0	3.5	0	4	0	4
3	0	4	0	4.5	0	5	0	5
4	0	5	0	5.5	0	6	0	6

TABLE 49.—IODIN 1-100. EXPOSURE 7 MIN.*

Day.	A	A′	B	B′	C	C′	D	D′
1	0	3	0	2.5	0	2	0	3
2	0	4.5	0	3.5	0	4	0	4
3	0	5	0	4.5	0	5	0	5.2
4	0	6	0	5	0	5.5	0	6

TABLE 50.—IODIN 1-100. EXPOSURE 6 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	0	3	0	3	0	3	0	2.5
2	0	4	0	4	0	3.5	?	3
3	?	5	0	5	0	4.5	.2	3.5
4	?	6	0	6	0	5.5	.5	5

TABLE 51.—IODIN 1-100. EXPOSURE 5 MIN.

Day.	A	A′	B	B′	C	C′	D	D′
1	0	2	0	2	0	1.5	0	2
2	?	3.5	?	4	?	3	0	4
3	?	4	.5	5	?	4	0	4.5
4	?	5	.7	6	?	5	0	5

and D show a growth equaling 1/3 control growth, while B is free from growth. On third and fourth days this growth increases rather slowly, equaling on the fourth day about 1/3 control growth.

1-200 for *fifteen* minutes shows a marked inhibitory effect. First day there is no growth. On the second day points of growth appear on A and D which on third and fourth days increase scarcely any. On the second day growth appears on B and C which equals about ¼ control growth. This increases slightly on the third and fourth days, equaling about 1/3 control growth.

1/200 for *thirty* minutes shows a very marked inhibitory effect. First day there is no growth. A and D remain free from growth throughout. B is free from growth until fourth day when several points appear. On the second day points appear on C which on the third and fourth days give a slightly increasing fractional growth (1/10 control).

1/200 for *sixty* minutes shows no growth throughout.

1/100 for *fifteen* minutes shows no growth.

1/100 for *ten* minutes shows no growth.

1/100 for *seven* minutes shows no growth.

1/100 for *six* minutes shows a marked inhibitory effect. First day shows no growth. B and C are free from growths throughout. On the second day D shows points and A is sterile. On the third day A gives a point, D a slight fractional growth. On the fourth day A shows two points, D, a slight increase, equaling 1/10 control growth.

1/100 for *five* minutes exhibits a very marked inhibitory effect. On the first day tubes are free from growth. D is free from growth throughout. On the second day A, B and C show points. On the third and fourth days A and C show no increase in growth, while B shows a small fractional one, equaling ⅛ control growth.

SUMMARY OF EVIDENCE ON TUBERCULOSIS.

The evidence shows that to produce the death of the *Bacillus tuberculosis* an exposure to a 1/200 iodin solution for one hour or to a 1/100 solution for seven minutes is necessary. An exposure of less than seven minutes results in a growth. When we come to the consideration of the inhibitory effect we find that a 1/1000 solution for one hour is without effect. Inhibition begins to be shown slightly by a 1/500 solution for fifteen minutes. From this point on, as the period of exposure is increased and as the solution employed becomes of greater strength, the inhibitory effect becomes progressively more and more marked until the death point is reached. Then, if we try to lessen the time of exposure to the necessary strength, we come into the sphere of inhibition which decreases as the exposure decreases.

(To be continued.)

UNILATERAL TRANSITORY PARALYSIS OF THE ABDUCENS.

WITH REPORT OF CASES.*

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Paralysis of the sixth nerve occurs with comparative frequency in ophthalmic practice. It may be unilateral or bilateral alone or associated with lesions of other ocular nerves. The causes may be many, including syphilis, congenital or other traumatism, diabetes, central lesions, etc. One etiologic factor, however, has heretofore been questionable and has created considerable controversy; that is, hysteria. Some doubt the existence of a hysterical abducens paralysis, and Möbius[1] denies the existence of hysterical paralysis of the eye muscles at all, and ascribes such paralyses to traumatism; and considers, he states, the "apparent" abducens paralysis to be a spasm of the internal recti. On this point, however, I think we have indisputable proof, as evidenced by cases reported by such authorities as Leber, Parinaud, Nonne and Beselin, Guttman, Duchesne, Roder and Wilbrand.

Within the past twelve months there have come under my observation four cases of unilateral abducens paralysis, which were transitory in character and not associated with paralysis of other ocular nerves or with any tangible disease of any sort.

CASE 1.—Miss Nora Y., aged 9 years, school girl, was brought to the Jewish Hospital Dispensary, June 14, 1904, by her mother, who stated that, three days before, the child had complained of seeing double and the mother then noticed that the child's eyes were crossed. The child had had severe headaches all winter, but the mother was positive that there was no crossing previous to three days before she came.

Examination showed deviation of left eye inward and inability of patient to carry eye outward past median line. The amount of inward deviation of left eye was to the extent of one-third, the cornea being covered by inner canthus. All other ocular movements normal. Pupils normal and react to light and accommodation. V. O. D. = 14/15. V. O. S. = 14/20. Fundus normal. Refraction normal. Fields normal. General appearance good. Color healthy. Mother stated that the child had "brain fever" when 1 year old. Otherwise has been in good health. Mother has four children, all healthy; no miscarriages. No history of syphilis.

Thinking, perhaps, there might possibly be some central trouble or some hysterical signs I might have overlooked, I referred her to the neurolgic clinic. Dr. Schwab could elicit no sign or symptom of hysteria or otherwise. In the face of these facts we still considered the probability of the condition being functional and suggested to the little one that it would get better with medicine. Three-grain doses of sodium bromid were given three times daily. On June 21, patient returned and was able to carry eye outward about 30 degrees. June 30, 1904, patient returned cured.

CASE 2.—Clara A., aged 12, school girl, came to Washington University Eye Dispensary, Sept. 6, 1904. On previous day she noticed blurred vision and diplopia. Parents noticed at same time that eyes crossed. The child was apparently healthy and strong; has had usual diseases of childhood. No history of syphilis or of traumatism. Examination shows deviation of right eye inward and inability to carry right eye outward past median line, in fixing with left eye covered or with both eyes open. All other ocular movements normal. Pupils react to light and accommodation. Had worn glasses for headaches for past three years. V. O. D. 0.5 D. cyl. ax. 90° = 14/15. V. O. S. 0.62 D. cyl. ax. 90° = 14/12. Fundus normal. Refraction +2. No signs of hysteria or other disease.

Patient was treated with three grain doses of sodium bromid and suggestion, and asked to return in a few days. Did not return until Sept. 21, but with complete resolution.

CASE 3.—Maggie S., aged 28, came to office Oct. 15, 1904, with paralysis of left external rectus, which came on suddenly two days before. She stated that about a week before she received a sudden shock by witnessing a street car accident, that she grew suddenly dizzy at the time and nauseated, but felt well after that until two days before coming to office. She is now extremely nervous, but no definite hysterical signs could be elicited. Pupils react to light and accommodation. V. O. D. = 14/300 — 4.5 D. S. ⌒ — 0.5. D. cyl. ax. 120° = 14/25. V. O. S. = 14/25 + 0.5 D. cyl. ax. 90° = 14/15.

Ten grain doses of sodium bromid were given three times daily and October 25 there was complete recovery.

CASE 4.—Minnie V. D., aged 16, came to office May 9, 1905. Two weeks before had tingling of whole left side of head; this lasted one week. When tingling subsided, she noticed that she saw double. She has been troubled with headaches since going to school. She has had usual diseases of childhood; no history of syphilis. Has always been nervous. Present condition: Inability to carry right eye outward past median line, either with left eye closed or with both

* Read in the Section on Ophthalmology of the American Medical Association, at the Fifty-sixth Annual Session, July, 1905.

1. Graefe-Saemisch: Handbuch der Gesammten Augenheilkunde, vol. viii, Chap. xi, p. 11.

eyes open. In state of rest, right eye deviates inward. V. O. D. = 14/25. V. O. S. = 14/20. Fundus normal, fields normal. Fauces anesthetic, cornea slightly so. Patient giggles at slightest provocation. Ordered compound syrup of hypophosphites. May 16, 1905, there was no improvement in patient's condition. Ordered sodium bromid 5 grain doses three times daily. Patient did not return until June 17, 1905, when complete resolution had taken place.

Borel[2] reports a case of "true hysterical paralysis of external rectus muscle." The motor disturbances predominated in his case, sometimes in the right and sometimes in the left. In the field of fixation the lateral fixation was 43 degrees inward and 41 degrees outward in the right, and 37 degrees inward and 41 degrees outward in the left eye, which does not indicate a weakness of right rectus muscle, but a failure of all associated movements to right. Again, he states, "at a distance in the median plane homonymous diplopia was observed; nearer, single vision was established, still nearer cross diplopia appeared." These are symptoms of contracture of convergence.

Parinaud[3] says that Samelsohn stated to him that he had seen a case of hysterical paralysis of the sixth pair. Leber[4] and Schwab[5] report cases of bilateral abducens paralysis following typhoid convalescence in the former, there being albuminuria.

Guttman, Cohn, Landenberg, Bernheimer and others report cases of bilateral abducens paralysis in diabetes, which recovered on improvement of general condition. Wilbrand[6] observed abducens paralysis in two nervous women without a deviation inward. In directing the eye straight ahead there was no diplopia. When, however, the eye was directed outward, the eye of the paralyzed side remained fixed while that of the normal side followed the movement of the fingers. In these cases were also present photophobia, blepharospasm and a number of other nervous symptoms.

Röder[7] published, in 1891, a case in which a young 17-year-old girl had a mixed anesthesia, abducens paralysis and mydriasis left. Pupil did not respond to light or accommodation. There was paralysis of accommodation, monocular diplopia and contracted visual field. Patient got well by suggestion.

Freund and Rie[8] report that there occurred, in two cases of cerebral hemiplegia in children, following a new attack of illness (associated with fever and convulsions), a paralysis of the abducens which disappeared in a short while. Schweigger[9] reports a case of contraction of the interni with limitation of movements of the externi. Nonne and Beselin[10] report a 24-year-old patient with "grand hysterie" with hypalgesia, hypasthesia and diminished sense of taste, smell and hearing on left side, with a spastic ptosis and paralysis of left abducens. Patient unable to carry left eye outward past median line. After several attempts, however, by fixing head and manipulating a mirror which patient was looking into, left eye was finally carried outward; but immediately lapsed into former condition.

I am sorry that I did not know of this mirror test at the time I examined my cases, but I do not believe, however, that it would have affected the result.

In conclusion, I maintain that these cases prove that a functional (or hysterical, if you will) paralysis of the abducens does occur; that it may be unilateral or bilateral, and that there need necessarily be no other hysterical signs or symptoms evident, all of which is of the greatest importance from a diagnostic, as well as a prognostic, standpoint.

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3. Ocular Manifestations in Hysteria. Norris and Oliver System of Diseases of the Eye.
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7. F. Weiss: Montrsch. f. Pschiat. und Neur., 1899, vol. xi, No. 6, p. 420.
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10. Kontractur und Lähmungszustande bei Hystérie. Festschr des Artzi ver in Hamburg.

DISCUSSION.

DR. H. STILLSON, Seattle, Wash., said that he had observed that the ability to rotate the eye outward depends largely on one's individual facility, and that the education of one's external recti is much more difficult than the education of one's internal recti. The examination of eyes with Stevens' instrument often surprises one at the difference in the rotation at different times; a rotation outward at one sitting being very different from that of a subsequent reading. Dr. Stillson thinks, therefore, that some cases mentioned as paresis of the external recti may be put down in the class of hysteria or in the class of cases modified by one's lack of facility, and that in those patients who have recovered rapidly the recovery may be due to the education of the external recti.

PROGRESSIVE AXIAL MYOPIA.

ITS PREVENTION AND CURE BY APPROPRIATE TREATMENT OF THE INTERNAL AND EXTERNAL RECTI MUSCLES; WITH REPORT OF CASES.*

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It must be admitted that, while the science of ophthalmology, as a whole, has shown a remarkable advance in recent years, our knowledge of the etiology, and particularly the treatment, of progressive myopia is little, if any, greater than it was twenty or thirty years ago.

Various eminent authorities, during recent years, have described what they considered the principal factor in its causation, while others have studied exhaustively the gross and microscopic tissue changes that may be present in the myopic eye; and still others have suggested many ways of bettering the hygienic surroundings and increasing the comfort of the myope; yet no one, to my knowledge, has ever suggested a definite form of treatment for the prevention or cure of this unfortunate condition.

It has been stated by Cohn that 10 per cent. of the blindness of inmates of public institutions in Germany is directly due to an advancing myopia; and Tschering, in Copenhagen, estimates the proportion of myopes in the community at 8 per cent.

In this country, where we possess every facility, and the skill and inclination to do the best refraction work, and in spite of the excellent school hygiene that is nearly everywhere maintained, it is well known to all ophthalmologists that myopia is steadily increasing.

This is more noticeable, of course, in the centers of learning and industry, where a large and increasing necessity for close work is imposing its penalty on all but the more perfect eyes.

It is expedient, then, that we should direct our efforts to the perfection of some means of checking the progress of this dread destroyer of sight and happiness.

To this end I wish to submit a plan of treatment,

* Read in the Section on Ophthalmology of the American Medical Association, at the Fifty-sixth Annual Session, July, 1905.

evolved, in greater part, from my own experience, and employed with a very gratifying degree of success for the past five or six years.

Briefly, this treatment consists, in addition to the usual routine of correcting refractive errors and vertical imbalance by glasses, and strict attention to the general health, of properly regulated exercise of the internal recti muscles with prisms, and the careful administration of galvanism, locally.

In exceptional cases the above is found inefficient and must be supplemented by operative measures, consisting of tenotomy of the external rectus of one or both eyes.

I am well aware that none of these procedures are new, yet, after a thorough search through a very extensive literature, no mention was found either in special articles or text-books of any one of them having been advised or used in the same manner and for the same purpose as will presently be described.

Both muscle exercise and operative procedures are recommended in extreme cases for relief of the asthenopic symptoms that accompany progressive myopia, and, as a matter of fact, it was while using them for this purpose that I first became aware of their efficiency in preventing the onset, or checking entirely the progress of the disease itself.

As an illustration, the following is quoted from the recently published sixth edition of "Diseases of the Eye," by Edward Nettleship, and it would seem to cover what has been done along these lines:

Preponderance of the external over the internal recti, insufficiency of convergence, if not cured by partially correcting glasses, may be treated by the division of the external rectus of one or both eyes, but not until after an effort has been made to strengthen convergence by means of properly regulated prismatic exercise.

For this purpose the patient fixes his gaze on a point of light twenty feet away, while the strongest prisms, base out, with which the patient can fuse the light, are placed in a spectacle frame.

After regarding the light a few moments, the eyes being still fixed on it, the prisms are raised and the convergent effort relaxed; after a few moments the prisms are again lowered before the eyes, and this alternate lowering and raising of the prisms, and the consequent stimulation and relaxation of convergence persisted in for five minutes.

These exercises should be repeated three times daily, and the strength of the prisms increased as the patient is found to be able to fuse higher ones. By this procedure the power of adduction is frequently carried to 100 degrees within a few weeks, with a great relief of the asthenopia.

It will be noticed in the above quotation—and the same is true of other writers—that, while these or similar measures are advised for relief of painful symptoms accompanying myopia, nothing is said regarding their effect on the progress of the disease.

It was my custom in the first years of practice to treat all cases of exophoria, whether accompanying myopia or not, by giving the patient prisms of different strengths to use at home, with printed instructions for their guidance, and seeing them at the office only at infrequent intervals, or at the completion of the treatment. By this method gratifying results were obtained in a certain proportion of cases, but there was a considerable number who from one cause or another did not carry the treatment to a successful termination. Either they did not use the prisms understandingly or, not seeing an early and decided improvement in their symptoms, discontinued their use too quickly. Another, and more serious, defect in this method was finally discovered to be that whatever good results were obtained were not in the majority of cases permanent.

One or two of the cases that will be reported at length illustrate this not only as regards the exophoria itself, but in connection with the development of myopia.

DESCRIPTION OF THE TREATMENT.

Realizing that the poor results in some cases were probably due to a lack of thoroughness in applying the treatment, it was decided to keep the patient constantly under observation during its course, and, having in mind the tonic and stimulative properties claimed for the interrupted galvanic current, this was used in connection with the exercises. Better results were soon apparent, and it was found that by continuing the treatment sufficiently long the exophoria was permanently cured in practically all cases, and that without resort to operation. A complete description of the treatment as now used follows:

The patient is given a single square prism, usually 10 degrees, or weaker if necessary, with which to begin the exercises at home. A small candle or gas flame that does not illuminate the surroundings too much is placed on a level with the eyes, and not less than twenty feet away. It is desirable to have the room darkened by lowering the shades, and that it should not contain too many articles that might cause reflections.

It is supposed that distance glasses have been ordered when needed, and with these in place the patient is instructed to produce a crossed diplopia by holding the prism over either eye, base out, and then to attempt to again fuse or bring the two lights into one.

If a prism of the proper strength is given and it is rotated until the two lights are at the same level, little difficulty will be experienced in getting them together.

Since the eye that is covered by the prism is the one that converges in overcoming this artificial diplopia, it is necessary to divide the exercise between the two eyes, say two minutes with the right eye, then two minutes with the left, removing the prism as often as the lights merge into one. This is to be done twice, and, if convenient, three times each day, but not for a longer time than two or three minutes with either eye, and if very noticeable pain is caused the time should be shortened. Each strength of prism is used at least two or three days, or until the lights can be fused very quickly and without apparent effort. When this is accomplished with the 10 degrees, a 3 degrees is added and the two used in the same manner; then the 3 degree is replaced by a 5 degree, and, finally, all three are used, being held together conveniently by a rubber band. When the 18 degrees can be overcome, the 5 degree and 3 degree are replaced by another 10 degree, and the same process may be repeated until a sufficient power of convergence has been obtained, the minimum in the writer's practice being 48 degrees.

The average length of time necessary to reach this point is between three and four months; and during this period the patient should make three or at the least two visits at the office each week to receive local treatments.

The battery or wall plate should be equipped with a milliampere meter, rheostat and automatic interrupter. A double-eye electrode with long handle is attached to the positive pole and the well-moistened sponges applied over the closed upper lids, being held in this position by the patient, while the opposite pole, carrying a moistened sponge, is placed at the nape of the neck by the operator.

The interrupter is so adjusted as to produce about thirty or forty interruptions per minute, and the handle of the rheostat is turned gradually until a faint flash is seen by the patient with each break in the current.

The duration of treatment is five minutes, and it should never cause any discomfort or pain; the slight blurring of vision that may follow its application passes away in a very few moments.

Aside from the intrinsic value of the electricity, its use enables the surgeon to be sure that his instructions regarding the use of the prisms are being fulfilled, and this, in my experience, has been of vital importance.

SUMMARY OF CASES.

Before reporting any cases at length, it may be of interest to present a brief summary of fifty cases taken from the writer's private records, as illustrating with what degree of uniformity certain conditions and symptoms are present. In selecting these cases, none were taken that have been seen for the first time within the past two years, and only those in which the myopia was undoubtedly progressive, this latter being determined by a history of recently failing vision either with or without glasses, and a consideration of the other symptoms. The figures given below are approximate:

Seventy per cent. were females; 30 per cent. males.
Average age at which glasses were first worn, 17 years.
Youngest age at which glasses were first worn, 8 years.
Oldest age at which glasses were first worn, 34 years.
Cases in which no glasses had been worn, 20 per cent.
Cases in which previous glasses were fitted by oculist, 30 per cent.
Cases in which previous glasses were fitted by optician, 50 per cent.
Amount of myopia present, 0.25 to 14.00.
Number of cases requiring operations, 3.
Astigmatism present in 50 per cent. of all eyes, 0.25 to 4.00.
Typical fundus changes in 30 per cent. of all eyes.
Cover test positive in all cases.
Average abduction, 9 degrees.
Average adduction, 10½ degrees.
Highest abduction, 16 degrees, with adduction of 18 degrees.
Highest adduction, 18 degrees (two cases), with abduction 11 degrees and 16 degrees.
Lowest abduction, 4 degrees, with adduction, 8 degrees.
Lowest adduction, 7 degrees, with abduction, 7 degrees.

The following is a record of only the more important symptoms:

Soreness or pain in the eyes themselves, 28 cases.
Some form of headache in all cases.
Panorama headaches and car sickness, 30 cases.
Photophobia in 30 cases.
Nervousness, 20 cases.
Temporary diplopia, 5 cases.

Of course, it is not claimed that every patient not already myopic, who may exhibit any or all of the above conditions, will develop myopia or even show a decrease of hyperopia, if present; nor that every case of myopia (which certainly during its development was progressive) is due to an abnormal converging power, since the general conditions of health and certain occupations may be the determining causes. This is evidenced by a large number of cases that have become stationary, without local treatment of any kind, but simply through change of occupation or improvement in health. On the other hand, the above findings would seem to justify us in promulgating the rule that any case of myopia accompanied by asthenopic symptoms or headache, with deficient converging power and a true exophoria, as shown by the cover test, may be safely classed as progressive, and should receive appropriate treatment, directed not only to a relief of symptoms, but to the abatement of the disease itself.

It must be understood that a number of etiologic factors other than those mentioned may be present in every case, such, for instance, as heredity (the term being used here in the sense that certain inherited anatomic peculiarities may predispose to the acquirement of a myopia); astigmatism, on the importance of which in this disease Ball, in his recently published and very excellent textbook, lays so much stress; and congestion, induced by stooping or other unfavorable positions assumed by the patient, either through habit or from necessity in certain occupations.

We should then, as heretofore, advise our myopic patients as to the proper use of their eyes; also as regards the amount of work and its illumination; and, further, it is of the utmost importance that their general condition of health should receive very careful consideration if we would get the best results from our local treatment.

In a majority of cases reported in this paper, it has been possible to make recent observations, and in none of these has there been an increase of the myopia sufficient to warrant a change of lenses.

The following cases are typical, and are reported at length merely to emphasize certain points in the treatment, and to direct your attention to some of the difficulties of its application:

CASE 1.—Ella D., aged 9 years, Aug. 25, 1898. Never has worn glasses. Could not see writing on blackboard from rear seat. General health good. Has supraorbital and temporal headaches after reading a few minutes. Car sickness marked.

V. L.=20/50. V. R.=20/50. Abduction, 7°; adduction, 12°. Cover test shows divergence. Refraction with homatropin. L.+1.25, ax. 90=20/30+R. 1.50, ax. 90=20/30+.

These glasses were ordered, with instructions for patient to return in two weeks.

Nov. 13, 1898: Patient can see much better with glasses, but still has same symptoms, although headaches are not quite as frequent or severe.

Distant vision, 20/30+ both eyes.

Prism exercise was advised and a full set of prisms was given to use at home. Prisms were returned at end of six weeks. She could overcome the diplopia produced by 48°, and headaches had ceased.

Nov. 25, 1899: Patient came in complaining of headaches and failing distant vision.

Vision with glasses: L.=20/50— R.=20/50—.

Refraction with homatropin: L.—1+1.25 ax. 90=20/30+ R.—1+1.50 ax. 90=20/30+.

Abduction, 7°; adduction, 16°; cover test +.

Prism exercise again advised, but not used.

July 28, 1903: Again complains of poor distant vision.

Abduction, 7°; adduction, 16°.

Refraction with homatropin: L.=—1.75—1.25 ax. 180°= 20/30+R.—2—1.50 ax. 180=20/30.

Prism exercise and galvanism for ten weeks, with relief of all symptoms.

Sept. 10, 1904: Came in to have broken glass replaced. No symptoms. Abduction, 7°; adduction, 35°. Vision, 20/30+, both eyes.

CASE 2.—Anton R., 12 years old. First seen Oct. 11, 1899. Has noticed failing distant vision for last year and a half. Eyes ache after studying and are frequently inflamed. General health good.

V. L.=20/100. V. R.=20/100+. Abduction, 4°; adduction, 8°. Cover test +. Refraction with atropin: R.—1.25—0.50 ax. 90=20/15— L.—2.25=20/20+.

Muscle exercise was advised, but not taken at this time.

Jan. 27, 1902: Vision with glasses: 20/200, each eye.

Refraction with homatropin: L.—3.50—0.50 ax. 90=20/15. R.—4.50=20/20+.

Myopic crescent marked; no other gross changes. Muscle exercise and galvanism, three months.

Oct. 19, 1904: Last seen. Vision with glasses better than 20/20 in each eye. No symptoms.

CASE 3.—Miss O. R., 15 years old. First seen Nov. 13, 1900. Worn glasses since 8 years of age; fitted by optician, and changed by him twice for stronger ones. Has nearly constant

pain in eyes, and frequent supraorbital headaches. Photophobia. Floating spots before both eyes. Mother always near-sighted. Present glasses —10.00 both eyes. V. 4/200, each eye. With glasses, V.=20/200, each eye. Refraction with homatropin: L.—14—1.50 ax. 120=20/40. R.—14—1.50 ax. 90=20/50+; abduction, 10°; adduction, 16°. Cover test +.

Muscle exercise and galvanism were given fourteen weeks, with relief of all asthenopic symptoms.

Dec. 10, 1901: In answer to a request to come in, she wrote as follows: "My eyes are getting along nicely, and I have had no trouble with them this winter."

CASE 4.—Mrs. B., 44 years old. Seen Nov. 3, 1899. Worn glasses ten years. Has had them changed frequently by opticians. Has quite severe pain in eyes after a few minutes of sewing, reading or any near work. Nearly constant supraorbital and temporal headaches. Car sickness. Photophobia. She has not been without a headache for any length of time in twenty-five years. Has had three pelvic operations (the exact nature of which was not learned) for the relief of nervousness and headache, but without any benefit, so far as she could see. Is extremely nervous and suffers much with insomnia. Appetite good. Appears perfectly healthy, and weighs nearly 200 pounds.

Present glasses, L.—3.50. R.—4.50.

Vision with glasses, 20/50+, each eye. Abduction, 10°; adduction, 18°. Cover test positive.

Refraction with homatropin: L.—3.00—2.00 ax. 90=20/30+. E.—3.50—2.25 ax. 20=20/20—1 (letter; +1) added to above for reading.

Myopic crescent and thinning of pigment layer, but no other visible fundus changes. Glasses were ordered, No. 2, shade smoke. Prism exercise and galvanism were given at the office three weeks, when patient was compelled to leave for her home in Wisconsin. As she could not come in again for several months, prisms were given for home use. In March, 1900, was using 50° prism, and felt more comfortable in every way, but still complained of the headaches.

A tenotomy of the right external rectus was done in May, 1900.

In June the same operation was performed on L. external rectus.

This relieved entirely the headaches, and up to August, 1903, there was no recurrence, and no necessity for a change of distant glasses.

CASE 5.—Hattie K., 12 years old. First seen Jan. 27, 1900. Wearing glasses fitted by optician one year ago, —1.12 both eyes. Has frequent supraorbital headaches, most severe over right eye. Photophobia, conjunctival hyperemia. Has been kept out of school on account of nervousness. Vision L.=20/60. V. R.=20/70+. Abduction, 5°; adduction, 10°. Cover test +.

Refraction with atropin: L.+3.25 ax. 95=20/30+. R. +2.50 ax. 85=20/20—.

Muscle exercise advised and prisms used at home, with relief of headaches for the time being and great lessening of nervousness.

Jan. 18, 1902: Came in complaining of failing distant vision and same symptoms as before. Refraction with homatropin: L.—1.25+3.25 ax. 95=20/30+. R.—2+2.75 ax. 85=20/20—.

Muscle exercise again given, but with the addition of galvanism. All eye symptoms disappeared and school was resumed March 28, 1905. Has had no recurrence of headaches or other symptoms, and only slight nervousness. Vision with glasses, same as three years ago.

CASE 6.—Miss M., aged 23 years, seamstress; Oct. 29, 1900, V. L.=6/200. V. R.=10/200.

Is very nervous, otherwise general health good. First glasses fitted by optician one year ago, but not worn recently. Within last few months has been getting very "near-sighted."

After sewing for a short time has "drawing sensation between the eyes and extending to back of head." Eyes ache and are often inflamed. Photophobia; abduction, 12°; adduction, 12°. Cover test +. Refraction with homatropin: L.—10.00—2.50 ax. 180=20/40+. R.=—7.00—300 ax. 180=20/50—.

Muscle exercise and galvanism relieved eye symptoms, and to a great extent the nervousness.

April 20, 1902, patient was requested to come in. Vision was the same or a trifle better, and no symptoms were complained of.

Patient has never lost any time from her sewing on account of her eyes.

It is reasonable to suppose that without treatment this patient would have developed a still higher degree of myopia, perhaps with the loss of useful vision, as the fundus changes were already quite marked.

I feel justified in basing the following conclusions on the results so far obtained:

1. The most important etiologic factor in a very large number of cases of progressive myopia is an insufficient power of convergence.

2. It is immaterial, in so far as the question of treatment is concerned, whether this inadequate converging power is the result of some anatomic defect in the shape or position of the orbit, or whether it is due to a fault in the insertion or innervation of the extrinsic ocular muscles.

3. In all cases in which destructive fundus changes have not already resulted in too great a loss of vision it is possible to check the progress of the myopia or in the proper sense of the word to effect a cure.

4. Since we have no means of knowing who among our young patients will develop a myopia which may lead to great impairment of vision or perhaps blindness, it should be our constant care in practice, and especially with those of us who have to do with the examination of the eyes of children in the public schools, that, in addition to the correction of refractive errors, the eye muscles should receive due attention, and, when found defective, proper prophylactic treatment instituted or advised.

5. For obvious reasons none but specially qualified legal practitioners of medicine should be allowed to prescribe glasses for, or in any way treat, myopia.

DISCUSSION.

DR. G. C. SAVAGE, Nashville, Tenn., expressed his inability to explain just why some cases of myopia are progressive, and whether or not the want of converging power predisposes to this increase. He illustrated his understanding of the convergence of myopic eyes on the blackboard. The myopia is, say, 3 degrees. Dr. Savage believes that there is a definite relationship between the tenth and the third (the accommodative and convergence) centers in the brain that the accommodation of myopic eyes is effected not by the conjugate centers, but by the basal centers. Now, without accommodation there may be convergence, but he does not believe that it is volitional if the myopia is 3 diopters or more. Unless there is no necessity for activity of the ciliary muscles in near vision, the tenth conjugate brain center is quiet. But without convergence there would be diplopia. Now this is an abnormal or fusional convergence effected by the right and left third basal centers. That may tend toward increasing the myopia, but how much he is not able to say. The thing to do for these eyes, however, is to correct the myopia in full and to advise that the correction be worn for all distances if the patient is young. When the myopia is corrected for distance and the same is worn for near, the accommodative center becomes active, and the third conjugate center becomes active, and convergence is effected by the volitional center and not by the fusional or basal center. Dr. Savage believes that when there is no need for volitional accommodation there is only fusional convergence.

DR. F. S. CROCKER thought it likely that all agree with Dr. Savage that it is the proper thing to correct the myopia fully in nearly all cases, but Dr. Crocker did not think that that has anything to do with the arrest of progress of the myopia. Fifty per cent. in his experience have been fitted by opticians, and he said it is a common experience to find that the optician overcorrects myopia, yet it is progressive.

THE NON-TOXIC AMBLYOPIAS.*

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I believe that the non-toxic amblyopias can be better studied if considered under three heads: 1. Those cases of amblyopia exanopsia due, as is usually believed, to the inability to use corresponding areas of the retina at the same time. This may be due to high refractive errors, to improper balance of the extraocular muscles, or to a non-development of the fusion center *in the cerebrum*.

2. That large group characterized by irregularly contracted but constant fields, impaired vision with careful tests, often only perceiving moving objects, but never interfering with locomotion or similar acts, frequently monocular diplopia, etc., etc., and known as the hysterical amblyopias.

3. That similar but sufficiently different group to justify their place in a separate class, characterized by impaired vision, contracted fields for white and colors always retaining their normal relationships, i. e., no reversal, and being proportionate to the visual acuity; these cases are usually designated as anesthesia of the retina.

Then, lastly, we have the group due to traumatism, often where there is evidence of pathologic changes of the fundus in the form of an old rupture of the choroid or retinal hemorrhage that has left the parts of the fundus uninvolved healthy, *but vision has not returned*. These cases are closely allied to the group just preceding, differing only in their etiology and the limited results that can be brought about by treatment.

The diagnosis of the cases of amblyopia exanopsia is not usually difficult, the defective vision, the apparently normal fundus, the one eye squinting frequently, and the high refractive error in one or both eyes usually renders the case clear from the first. It is difficult to decide whether the squint is due to the defect in vision or the reverse, but in a large proportion of cases the former is doubtless the case.

What shall we do in these cases? I do not believe, when we prescribe lenses and turn the patient away without any other treatment or advice regarding the amblyopic eye, that we have done our full duty, providing the patient is under 40 years of age. Of course, the younger our patient the greater the chances of bringing about permanent improvement, but cases like the one recently reported by St. John Roosa, where a man of 46 lost his seeing eye, and after five years the vision in his amblyopic eye had improved from 20/200 to 20/30 with an appropriate lens, the near vision improving much more rapidly than that for distance, and the several cases of this kind found in ophthalmic literature encourages us to try to improve these eyes.

I have tried numerous devices, such as covering the good eye for one or two hours daily, the amblyoscope, etc., but have found the convex glass cure, as recommended by Fronmuller in 1857, the most satisfactory. I can not do better than to quote his directions in full:

In this sort of exercise, printed types are best suited as visual objects, since in them there is a change from letter to letter, and, therefore, the attention must be directed uninterruptedly to the object, and mistakes, which have slipped into the estimate of what is perceived, appear immediately by the context, and therefore, invite correction. These printed types must, of course, be well illuminated, and must moreover, be projected on the retina under a large visual angle, in default whereof they appear, even in slight torpor of the light-perceptive apparatus, as images which can not be deciphered. They must, therefore, be chosen large, and brought near the eye. But in order to see as clearly as possible at short distances, convex glasses are usually needed, as the amblyopia exanopsia is, as a rule, accompanied by weakness of the apparatus of accommodation. Convex glasses are, moreover, under all circumstances very useful, as, by an apparent brightness of the retinal images, they increase the distinctness of the perceptions and facilitate the choice of test-types. It is, therefore, the custom to employ them in all cases, at least at first, and to distinguish the exercise in general with the name of treatment by convex glasses. The weakest convex glass must here be first ascertained, which enables the affected eye, the other one being closed, to decipher larger printed types (Jaeger, No. 12-20) at a distance of from 8-12 inches. With this glass the patient must now undertake, two or three times a day, exercise in reading, at first for five minutes, but gradually increasing the time, but should never push the attempt so far as to excite symptoms of fatigue, pain, congestion, or inflammation. On the whole this method of treatment, particularly in the higher degrees of amblyopia, demands in many cases great patience and perseverance, as it is often very long before any perceptible effects make their appearance. Finally, however, the power of vision often increases in favorable cases in very rapid progression. It is then time to pass to weaker glasses, and by lengthening the periods of exercise to rise to smaller and smaller test-types. Sometimes the progress is all at once arrested, and the power of vision does not improve, in spite of all that can be done. We should not then lose courage! for all at once it again advances, and we finally are able to employ glasses which are weaker by many numbers, or we may even reach a point where glasses are found to be superfluous. If the eye has become so far cured that ordinary printed type may be read fluently with weak convex glasses or without any, the reading exercise must still be continued for a time, in order to confirm the cure, and prevent relapses.

In some of these cases my results have been surprisingly good, in others less so, but in all cases where I could command the co-operation of the patient there has been some improvement.

With the hysterical amblyopias the diagnosis is, as a rule, not difficult, the concentrically narrowed field of vision with reversal for colors being characteristic. There are diseases in which we have this contraction, such as atrophy of the optic nerve and glaucoma, but without the reversal for colors. It may seem superfluous to call attention to this, but in their incipiency it often taxes the resources of the most skillful to say whether a disc is normal or not, and it is here that the exact perimetric measurements give us valuable aid, for in the nervous types the degree of contraction is practically equal in all meridians, whereas in the diseases mentioned it usually advances, with irregularly reentering angles toward the point of fixation, as is so tersely pointed out by Swanzy.

Parinaud says:

This concentric contraction of the field is also found in some cases of cerebral tumor and without neuritis, or it may result from intracranial pressure associated with certain forms of extensive cerebral meningitis; also it is not infrequently observed in epilepsy, and in this latter disease the diagnosis is often difficult, especially where there is temporary amaurosis, which is undoubtedly a manifestation of epilepsy, but unaccompanied by convulsive attacks. This is the same condition that Feré reports as characteristic of the amblyopia following epileptic attacks, i. e., the contracted field not accompanied by dyschromatopsia, especially the peculiar inversion of the color field.

The varying, never constant symptoms usually mani-

* Read in the Section on Ophthalmology of the American Medical Association, at the Fifty-sixth Annual Session, July, 1905.

fested by all hysterical subjects should be remembered, especially the symptoms of the hysterical amblyope, such as the contracted field with reversal for colors, the varying degrees of diminished vision, frequently monocular, the failure of accommodation, the scotoma and hemiopia, and the less frequent photophobia, blepharospasm, ptosis, etc.

The treatment consists in building up the patient's general health, by cold baths, plenty of outdoor exercise, tonics, electricity, the correction of any error of refraction, etc. These cases all recover, but some of them tax our skill and patience to the uttermost.

Then, we have those cases known as anesthesia of the retina, of which etiologically we have two classes, those of unknown cause and those due to traumatism. Charcot and Leber have asserted that these cases are of a hysterical character and place the seat of the disease in the brain and not in the retina, but do not the results of treatment prove that the trouble is in the retina?

These cases, as recently pointed out by Fox, are characterized by partial loss of vision for near and distance, contracted fields with retention of the normal color relationship, i. e., no reversal. The fundus is normal and refractive errors usually very slight. This usually comes on suddenly, but there may be a gradual loss of vision, and this is not accompanied by photophobia, blepharospasm, anesthesia of the cornea, etc., as the hysterical cases so often are. The traumatic cases are seen after the patient has recovered from an injury, such as a blow on the eye from a fist, or a cork from a bottle, etc. There is usually considerable amblyopia, with concentric contraction of the field, which may continue for a long time, while the ophthalmoscopic appearance may be normal; or there may be a lesion, such as rupture of the choroid, but the lack of vision is much greater than the ophthalmoscopic lesion leads us to expect.

I probably can illustrate better by describing a case recently treated:

Nellie F. was shot with a rifle ball over the right eye, October 8; two weeks later the ball could be felt on the crest of orbit at junction of outer and middle thirds. Small pigment spots could be seen in peripheral portion of retina and a small horseshoe shaped line of pigment about as large as the disc and on the nasal side of same. November 2 she counted fingers at 5½ feet; on January 7, fingers at 3 feet; after using high frequency current five minutes, at 5½ feet; January 11, fingers at 8 feet; after high frequency, 12 feet; January 14, fingers at 18 feet; after high frequency, 20/200. This continued until March 1, vision having reached 15/120, but could not be improved beyond this.

I do not think that there is any doubt that there existed anesthesia of the retina due to traumatism. Of course, there was, in addition, a rupture of the choroid, as shown by the ophthalmoscope, which accounts for the limited improvement.

The treatment of these anesthesias is electricity, which cures all the non-traumatic cases and benefits them; and, while the galvanic current seems to meet all the requirements, the faradic and high frequency are equally as efficient, and I think the latter is the most useful. The electrode should be applied over the closed lids, when the unipolar current is used. The bipolar is equally efficient. In applying the latter the patient can hold the other electrode in his hand. With the reflex amblyopias due to irritation of branches of the fifth nerve and other causes, such as intestinal parasites, I have had no experience.

DISCUSSION.

DR. G. C. SAVAGE, Nashville, stated that within the past two years he has had under his care a patient who goes to prove that the amblyopia of squint is mental and not ocular. The patient was a railroad man, but how he got into the service Dr. Savage does not know. He had one blind eye and one good one, the blind eye turning in toward the nose. He was on a train approaching Nashville, going up a steep grade, when a cinder penetrated the cornea and lens, producing a traumatic cataract in the good eye. The next morning he was taken to Dr. Savage's office almost entirely blind. The lens grew more and more opaque. In the meantime he had only the other eye to depend on, and it swung straight while the injured eye turned in toward the nose. In less than ten days the vision arose from 10/200 to 20/30. Every one of these cases should impress on physicians the fact that the blindness of the squinting eye is mental and not ocular. The first thing that should be done is to correct the muscle error, not by complete tenotomy, but by partial tenotomy and advancement, then the physician will never be confronted later by that patient with one eye looking in the opposite direction. The patients should be treated by operative measures first, and then the vision in the blind eye should be developed. The amblyoscope is, of course, a splendid instrument for that purpose. Atropin may be used in the good eye so that near vision with it will be impossible. Dr. Savage emphasized the necessity for first correcting the focal and muscle errors, thus making it possible to have binocular single vision, and then beginning training the blind eye. Dr. Savage mentioned a case of hysterical amblyopia. About six years ago a woman became totally blind in both eyes. Her actions led Dr. Savage to believe that the condition was hysterical. Pupillary reaction was gone. He told her with great positiveness that she would recover, that she would not be long in recovering, and that she would recover just as suddenly as she had lost her sight. One evening, when she was brought in by her sister, he said, "If you are not seeing by morning I am going to have you hypnotized." That night he received a telephone message to come to the boarding house where she was stopping. The patient was sitting there happy and radiant, and seeing as well as she had ever seen in her life.

DR. DUDLEY S. REYNOLDS, Louisville, said that a very common class of cases which, if not entirely ignored, are at least accorded insufficient attention are those cases of injury due to concussion, railroad accidents, trauma amblyopias. In these cases there is gradually increasing peripheral limitation of the field of vision and at the same time there is gradual reduction of the acuity of perception. He has known of cases of this kind in which no recognition of the nature of the trouble occurred for a year or for a year and a half after the accident, when it was noticed by the patient that the field of vision was narrower, or that acuity of perception was obtunded. Dr. Reynolds disagreed with Dr. Moore that no ophthalmologic indications are present. While these may be slight, they are nevertheless distinct. He is sure, too, that amblyopias that are non-toxic traumatic amblyopias, are not benefited by any form of treatment. They are very common and in some instances progressive, leading to entire or nearly entire blindness.

DR. WILLIAM CAMPBELL POSEY, Philadelphia, spoke in favor of the amblyoscope in developing vision in the squinting eyes of children. He has used it a great deal in the last few years and has found it a very valuable means of re-establishing binocular vision. In order that the treatment with this instrument should be efficacious, it is necessary that it should be employed before the child has arrived at the age of six years; if it be postponed until after that age the results will be disappointing. It should be remembered that treatment for the correction of squint can not be begun too early, and even at the age of one year, if the squint has been diagnosed, atropin should be used in the good eye, with a view to blurring its vision and inviting the patient to use the squinting eye. Some clinicians instill atrophin into both eyes. While when used in this way the spasm of accommodation may be overcome and the relationship between accommodation and convergence re-established, the vision in the squinting eye is not

improved, and the chief value which may be gained from the employment of the drug is not attained. At the age of 2 years the proper glasses should be put on the child, the lenses being selected by retinoscopy. Mr. Worth orders glasses at even a younger age, but Dr. Posey thinks that as the frames must be bound on the head by tapes, there is some danger in such young subjects, in interfering with the proper development of the bones of the face, and possibly with the eyes themselves, from pressure. The amblyoscope may be used at the age of 3 or 4 years, and if employed persistently, the results obtained are very gratifying.

DR. S. D. RISLEY, Philadelphia, declared that, in the management of squint occurring in early childhood we should not be unmindful of the somewhat limited group of cases in which the convergence is not due to the usual error of refraction, but is associated with, and probably caused by a central blind spot. It is not possible to demonstrate the presence of this in very young children, but its existence should be suspected when the well-known methods of treatment fail to correct the deviation. Dr. Risley has a number of times been able to verify this diagnosis after the child was old enough to permit a demonstration of a macular scotoma. He agreed with Dr. Posey and Dr. Moore that all cases of strabismus, when the deviation is due to refraction error, should be corrected by glasses very early in life. When seen early and when the correction is accurately made, there need be but little difficulty in securing binocular vision, even without the aid of the amblyoscope. Dr. Risley expressed surprise to hear Dr. Savage give credit to Dr. Worth for devising the use of atropin in the good, or fixing eye, to compel the use of the deviating eye. Dr. Risley has used the drug in this manner during his entire experience and the method did not originate with him so far as he knows. He called attention to the fact that in amblyopia of the deviating eye impaired vision may be due to the peculiar error of refraction, or to commencing disease in the macula, and the apparent amblyopia disappear as soon as these are corrected. Which eye shall deviate may be determined by the greater impairment of vision produced by the higher refraction error or by asymmetrical corneal meridians, for example; or it may be by a faulty attachment of one or more muscles to the globe, a condition which is often foreshadowed by certain deformities in the skull which lead to abnormalities in the shape of the orbit. It is obvious, therefore, that in the study of strabismus or other defects of ocular balance each case must be considered separately. We can formulate no law by which all cases are to be compared. We can not hope to secure by Worth's amblyoscope, or by any other instrument, binocular single vision until the refraction error has been accurately corrected, and not then in the presence of macular scotomata, or in cases where the anatomic relation of the muscles is at fault. In these last named cases the only hope is in prudent surgical interference.

DR. LEARTUS CONNOR, Detroit, stated that there is another class of cases, perhaps somewhat rare, in which nothing appears to account for the amblyopia occurring after previously good sight other than malnutrition, presumably of the retina. A year ago last October a man over 60 years old came to Dr. Connor with a history of good health previous to the past four months, when he had been gradually losing sight, until his vision was reduced to 6/200 in one eye and 8/200 in the other. The ophthalmoscopic image showed nothing except that the retinal artery was distinctly smaller in either eye than normal. The field of vision was very decidedly restricted. The refractive errors had been perfectly corrected. The only taing that constitutionally seemed to have any bearing on the case was a persistent indigestion. Dr. Connor employed vibratory massage on the eyeball and within a month vision was 20/200, and at the end of three months the patient could read Jaeger No. 1 and had 20/20 vision for distance. The only two factors observed in the case were the diminished blood supply to the retina and the poor digestion. The case puzzled Dr. Connor at the time and he is not absolutely clear about it yet, but the patient's improvement certainly followed the improved nutrition of the retina. Putting this observation with others, Dr. Connor is inclined to think that in not a few cases there is impaired digestion and interference with nutrient processes which tend to diminish the power of the special senses.

DR. T. W. MOORE said that from Dr. Savage's remarks he inferred that Dr. Savage has been able to produce binocular vision in these cases in which the patients were over 6 years of age. Dr. Moore has tried it in a few cases, but has absolutely failed. He thinks that has been the usual result. Recently he has only tried to increase the vision in the blind eye in patients over 6.

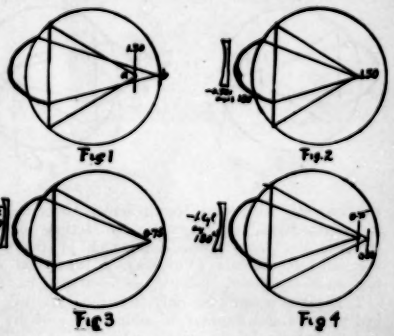
EXPERIMENTAL AND CLINICAL EVIDENCE OF DYNAMIC (SPASTIC) ASTIGMATISM.*

F. B. EATON, M.D.

SAN FRANCISCO.

Dynamic astigmatism may be defined as a condition of the eye due to dynamic changes in its media which prevent homocentric rays from being brought to a focus on the retina.

That such dynamic changes occur there is a preponderance of evidence and opinion on the part of Javal,[1] Georges Martin,[2] Landolt,[3] Dobrowolsky,[4] Oliver,[5] Noyes[6] Panas[7] and others. Among authors who deny this condition I note only Bull[8] and Tscherning.[9] The authors in the first group, while stating briefly a belief in the existence of the condition, are nearly all silent as to its clinical significance, implying, apparently, indifference to it in this respect.



As far as I know, no one has gone so carefully and exhaustively into the subjective phenomena pointing to dynamic astigmatic contractions as Georges Martin[10] of Bordeaux, who published a series of papers entitled "Etudes sur les Contractions Astigmatiques du Muscle Ciliaire," which were afterward collected and published in a small volume of about 200 pages. He records in detail about 150 cases in 300 eyes, and the volume is dedicated to Javal and Schiotz. In it the subject is presented with the utmost minuteness of observation and

* Read in the Section on Ophthalmology of the American Medical Association, at the Fifty-sixth Annual Session, July, 1905.

1. Annal. d'Oculistique, t. 88, p. 33, July, 1881, p. 1.
2. Ibid., 1886-1887.
3. Refraction and Accommodation of the Eye, pp. 301, 302.
4. Arch. f. Ophth., xix, p. 51, 1868.
5. Norris and Oliver, vol. iv, p. 420.
6. Diseases of the Eye, 1890, p. 111.
7. Traité des Maladies des Yeux, vol. i, p. 141.
8. Annal. d'Oculistique, Feb., 1892.
9. Optical Physiology (English Transl.)
10. Annales d'Oculistique, 1886-1887.

record in nearly every aspect in which it is possible to view it. When Martin's papers appeared, seventeen years ago, they attracted my attention because I observed facts clinically which apparently corroborated his. I was not convinced, however, though again and again, in the years following, in doing refraction work, I was reminded of the subject by phenomena similar to Martin's records.

It was not until 1902 that I began systematically to record these observations, and I was startled to find how accurate were his records when duly analyzed. In comparing his findings with mine, I found a difficulty owing to his peculiar method of marking his astigmatic dial and his trial-frame cells, and probably this has proved an obstacle to others in this country, since we follow the mathematical protractor.

To save time in recording cases, Martin adopted certain signs of abbreviation. To indicate that the dial lines appear equal, he wrote the sign ⊙ which exists in typography, especially in works on botany. If a line on the dial appeared clearer than the rest, he wrote the sign ○, writing by the side of it the number of degrees of said line. The principal portion of Martin's treatise deals with three forms of dynamic contractions: *Contractions rénitentes*, which I translate tonic contractions; *contractions élastiques*, which I translate clonic contractions, and *contractions résistantes*, which, of course, are the same in English. About half of the

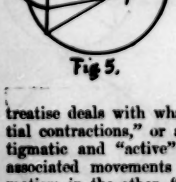


Fig. 5.

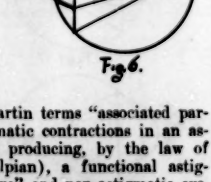


Fig. 6.

treatise deals with what Martin terms "associated partial contractions," or astigmatic contractions in an astigmatic and "active" eye, producing, by the law of associated movements (Vulpian), a functional astigmatism in the other, "passive" and non-astigmatic eye.

This paper permits me only to outline Martin's clinical methods and findings, to adduce some of my own, and to describe briefly certain subjective and objective investigations of my own and other eyes, which apparently prove dynamic astigmatism caused by the accommodative apparatus on the one hand, and by the extraocular muscles on the other.

I present first some simpler examples of Martin's cases, using the notation of our own charts and trial frame, but premising that I do not assume the correctness; as he did, of Javal's dictum of 1887, that the corneal astigmatism constitutes, almost without exception, the total astigmatism. I therefore select some of the cases in which atropin was used three or more days.

Miss ——, aged 17. Intense chorioidic blepharitis. Javal (ophthalmometer), 1.50 D. to rule. O. D. V. 1/1?? Em. ⊙ w.+ 0.50s. ⊙ 90.
w.—0.50c. ax. 180° ⊙ 1/1?
w.—0.75c. ax. 180° ⊙ 1/1
w.—1.00c. ax. 180° ○ 180 1/1?
Under atropin, w.—1.50c. ax. 180° ⊙ 1/1

Martin's tests may be graphically analyzed thus:

Under atropin the course of the rays is as in Fig. 1, *a* being the position of the focal line of those passing through the vertical, and *b* those through the horizontal meridian. Fig. 2 represents their path before the use of atropin with—0.50c. ax. 180° before the eye. Here the —0.50c. ax. 180° has thrown the vertical meridian rays back to that extent (myopia 1.00 D.) where, by a dynamic astigmatic contraction affecting the horizontal meridian rays, all rays meet at —1.00 D., the result being a myopia of 1.00 D. with equalized appearance of the astigmatic chart (⊙), but vision of 1/1?

Fig. 3 shows the path of the rays with a —0.75c. ax. 180° before the eye.

Now, the vertical meridian rays are thrown back to that extent, but the contraction affecting the horizontal meridian rays has relaxed; i. e., according to Martin the contraction is elastic (clonic); for, at the very first test, with no lens before the eye the chart lines were equal, and the myopia 1.50 D., the contraction has relaxed 1.50 D. —0.75 D. = 0.75 D., and the result is a myopia of 0.75 D. with the chart lines equalized (⊙) and V. = 1/1. Fig. 4 shows the path with —1.00c. ax. 180° before the eye. Here the vertical meridian rays have been thrown back so that in that meridian there remains only 0.50 D. of myopia. But now the contraction affecting the horizontal meridian rays does not relax, the rays still meet at 0.75; hence the horizontal line

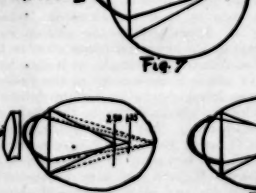


Fig. 7.

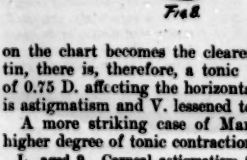


Fig. 8.

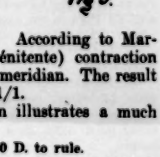


Fig. 9.

on the chart becomes the clearest. According to Martin, there is, therefore, a tonic (rénitente) contraction of 0.75 D. affecting the horizontal meridian. The result is astigmatism and V. lessened to 1/1.

A more striking case of Martin illustrates a much higher degree of tonic contraction:

L., aged 9. Corneal astigmatism 2.50 D. to rule.
Without atropin O. D. V.=2/5? ○w; w.—1.00c. ax. 180°. ⊙ V. 1/2.
Without atropin O. D. V.; w.—1.25c. ax. 180° ○w V. 1/2.
Without atropin O. D. V.; w.—1.25s.⌒—1.00c. ax. 180° ⊙ V. 2/3.

Fig. 5 shows the path of the rays under atropin, producing simple myopic astigmatism.

Fig. 6 shows the path of the rays before the use of atropin, with —1.00c. ax. 180 degrees before the eye. The cylinder has thrown the vertical meridian rays back to a focal point of 1.50 D. But the test now showed equalized chart lines, and vision only improved to 1/2. Martin therefore concludes that an astigmatic contraction of 1.50 D. affected the horizontal meridian lines, producing ⊙ but leaving a myopia of 1.50 D.

Fig. 7 shows the path of the rays with —1.25c. ax. 180 degrees before the eye. This cylinder has thrown

the vertical meridian lines back to the focal point, 1.25 D., but the contraction affecting the horizontal meridian lines has relaxed (clonic), and the vertical line of the chart is the clearest.

Lastly, with —1.25s.⌒—1.00c. ax. 180 degrees, the chart lines are equalized and vision becomes 2/3, equal to the vision under atropin with full correction by —2.50c. ax. 180 degrees. The contractions of the horizontal meridian thus neutralized are shown in Fig. 8; the black lines indicate a myopia in the vertical meridian of 2.50 D., and the tonic contraction affecting the horizontal meridian rays, of 1.25 D. The dotted lines indicate both the effect of the cylinder on the vertical meridian rays, and the disappearance of all contraction in the horizontal meridian under atropin.

The highest degree of dynamic astigmatism I have seen was in the following case:

W., aged 41. April 4, 1904, complained of defective vision and severe headaches. He has never worn glasses. He has been exposed late at night to electric light. Eyes are very irritable.

Examination.—V. O. C. = 21/29 ⊙. Neither minus or plus cylinders or spheres improved vision. Hyoscin hydrobromate .25 per cent. for 48 hours.

V. O. D. w.—3.00 cyl. ax. 5°=21/10???, ⊙

V. O. S. w.—3.00 cyl. ax. 175°=21/16, ⊙

The path of the rays with cycloplegic in O. D. is shown in Fig. 9.

Since both spheres and cylinders were refused before the use of the cycloplegic, there was a tonic dynamic contraction affecting the 5° meridian rays of 3 D.

A year later, skiascopy gave the same refraction in each eye, and Javal O. S. 1.25 to rule. Fig. 12 shows the path of the rays under atropin in 1894, in O. D.

January, 1905, aged 21. She has worn, for near only, a pair of +1.25 cylinders, axes 90°; has done much drawing. O. S. mucopurulent conjunctivitis.

Trial case: O. D. V. w.+1.50s.⌒—1.25c. ax. 170°=21/16, ⊙

O. S. V. w.+1.50s.⌒—1.25c. ax. 10°=21/16. ⊙

The path of the rays in O.D. in 1905 is shown in Fig. 13, which, when compared with Fig. 12, shows that in 1905 there was a contraction in the O. D., changing the principal meridians from 10 degrees and 100 degrees to 170 degrees and 80 degrees. Also that there was a general contraction of 0.25 D., and a tonic dynamic contraction in the meridian of greatest refraction of 0.75 D. It might seem well that a cylinder of 1.25 D. was accepted in 1905, as against one of only 0.50 D. accepted under long use of atropin in 1894. But the discomfort and irritation of the eyes and the conjunctivitis favor the original atropin correction. How often, after careful correction of compound hyperopic astigmatism, we are forced to increase the sphere, and to decrease the strength of the cylinder.

That Javal was himself the subject of a high degree of astigmatism against the rule is, I think, perhaps fairly well known. That his eyes corrected this, in his opinion, is not, I think, so generally known. At the International Medical Congress at London in 1881 he cited these facts, stating that when 16 years of age he saw the stars as perfectly round points when he made

Fig. 10

Fig. 11.

Fig. 12.

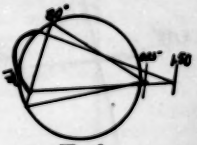


Fig. 13.

Among a large number of my own cases of the condition under consideration I select two examined after twelve and eleven years, respectively, as of value in showing how persistent are dynamic contractions, and how they may mask the true static refraction.

S. S., girl, aged 17, was seen first in 1892. Subjective tests then gave myopia corrected by: O. D.—5.00 sph. ⊙ O. S.—2.25 sph. ⊙

In 1895, aged 20 by skiascopy: O. D.—5.00 sph. O. S.—2.25 sph.

January, 1895: Atropin 1 per cent. for four days. Skiascopy: O. D.—4.50 sph.⌒—0.25c ax. 90°! O. S.—2.25 sph.

Trial case: O. D. V. w.—5.00s=20/20?? ⊙. O. S. V. w.—2.75s=20/20 ⊙

In 1904, nine years later, aged 29, Javal: O. D. 10± 1.37 D. O. S. 150° ± 0.50D.

O. D. V. w.—4.00 sph.⌒—0.75 cyl. ax 10°=21-19???⊙

O. S. V. w.—2.50 sph.=21/19, 21/13???

The path of the rays in O. D. in 1895 is shown in Fig. 10; in 1904, in Fig. 11.

Comparison of cuts shows a disappearance in 1904 of a tonic contraction affecting the meridian of 10 degrees, of 1.00 D. which atropin had not uncovered.

N. L., girl, aged 10, 1894. Asthenopia. Atropin 1 per cent. instilled for one week:

O. D. V. w+1.75s.⌒—0.50 cyl. ax. 10°=6/5,⊙

O. S. V. w.+1.75s.=6/5.⊙

an effort difficult to maintain. When 24 his manifest astigmatism was about 2.00 D., and at 44 it was 2.50 D. Javal recorded one of his cases, M. L., whose corneal astigmatism at the age of 34 (1865) was 6.50 D., and the subjective error but 4 D., indicating to Javal a dynamic contraction of 2.50 D. In 1869 the subjective astigmatism was 6 D., and in 1881 7.50 D.

Samuel Theobald[11] in 1885 cited three similar cases in hyperopes observed during twelve and sixteen years in which the astigmatism increased from 1 to 3 D.[10]

FREQUENCY OF THE CONDITION.

Dynamic astigmatism, in my own experience, exists very frequently, and nearly always in tired, irritable eyes which are affected with organic (corneal or lenticular) astigmatism. It is often overlooked simply because it is so often thought that the ciliary muscle and the convergence excess have been paralyzed completely by some weak or strong cycloplegic.

We say: "The tongue can no man tame." Who can tell when he has subdued the ciliary muscle? There are times when no man can tame it; nor are such times infrequent. I have tested hyperopic eyes which accepted no cylinders, though the corneal astigmatism was 1.50 D., yet by patient, so-called "fogging" for

11. Amer. Jour. Ophth., July, 1885.

days nearly this whole amount became manifested, together with a higher degree of hyperopia.

EFFECTS OF AGE, STATE OF HEALTH AND TEMPERAMENT.

It has been generally noted that dynamic astigmatism predominates in youth and disappears at the age of 40 or 50. As to disappearance at the presbyopic age, Javal and Martin note numbers of cases as exceptions, and I have seen undoubted ones between 50 and 65, and once in a woman of 73. General debility, the asthenic state, etc., prevent dynamic contractions, which, in the young, reappear when the patient recovers normal vigor. Martin exhibits a conservatism that points a lesson to some extremists of this day who would disenthrone migraine as a distinctly nervous disease. He states: "The contraction alone is incapable of producing neuralgic crises; it is necessary that it occur in a subject constitutionally affected with a diathesis (arthritism, or herpetism)."

MECHANISM OF DYNAMIC ASTIGMATISM.

This is not easily explained, for there is even yet no universal agreement as to the mechanism of accommodation. Martin[2] disavows any intention of asserting that certain fibers of the ciliary muscle contract, but only that the partial contraction in question causes a convexity of the lens in a certain meridian. Dr. Chas. A. Oliver[12] remarks that during astigmatic tests "it

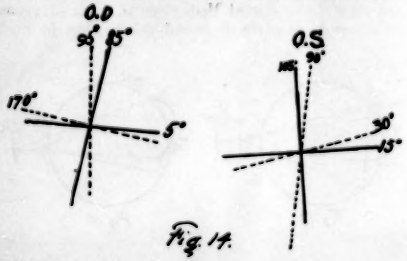


Fig. 14.

will at times be found not only that the amounts of the defect change when the examinations are made with the two eyes simultaneously, but that the relative angles of the two principal meridians likewise change. This is possibly to be accounted for in a measure by the action of the extraocular muscles in producing, both directly and indirectly, different degrees of tension on the eyeballs during their combined functioning."

Priestly Smith[13] cites a case in which in one eye there was total paralysis of the externus and internus, the other muscles being intact. The patient complained that vision of this eye was impaired. The ophthalmoscope showed no change in the fundus or media, but skiascopy showed 1.00 D. of astigmatism in the vertical meridian corrected with a —1.00 D. cylinder axis horizontal to normal vision. On recovery from the paralysis, all traces of astigmatism vanished.

This brings me to some investigations of my own, made on my own eyes and on those of others, in the endeavor to estimate the relative importance of the action of the accommodative apparatus on the one hand and of the extraocular muscles on the other, in producing dynamic astigmatism. These comprise two kinds of experiments:

1. The objective examination of the corneal curvature by the ophthalmometer with the eyes at rest, and the changes in curvature and direction of the meridians due to more or less convergence and accommodation.

2. Tests with the astigmatic chart at 20 feet in a static state of rest in the primary position, and the changes in the meridians and astigmatic curvature produced by concave spherical lenses resulting in increased accommodative effort with overaction of convergence (esophoria).

Subjectively, I have simple hyperopic astigmatism of 0.75 D. in each eye, accepting + 0.75c. ax. about 75 degrees, O. D., and same cylinder axes, exactly 105 degrees, O. S.

My corneæ have been repeatedly and carefully measured by different observers, and I have the faculty of converging moderately or excessively with either eye alone, the other remaining motionless in the primary position. On converging, the reflected and tangent images of the mires are always seen to separate in the meridian of least curvature 0.25 D., and to overlap in the one of greatest curvature from 0.12 to 0.25 D. Measurements on the arcs of the instrument give like results. Besides this, the principal meridians of each eye are shifted. Each nearly horizontal meridian inclining nasally 15 degrees, and each nearly vertical one outward 10 to 15 degrees, as shown in Fig. 14.

Taking the left eye, when converging the right on a point 8 to 10 inches in the median line, the tangent images at meridian 15 degrees of the left cornea are

Fig. 15.

seen to separate from 0.25 D. to 0.37 D., and to overlap about 0.12 D. near the meridian of 105 degrees. I say *near* these meridians because the principal meridian 15 degrees now becomes 30 degrees, and 105 degrees becomes 90 degrees; the more horizontal (15 degrees) inclining nasally 15 degrees, and 105 degrees inclining temporally 15 degrees.

A fellow physician has in the left eye a corneal astigmatism 15 degrees ± 0.75 D. On convergence, in contrast to my own case, the horizontal meridian inclines outward 6 degrees and the vertical 9 degrees inward, the curvature increasing slightly in each. (Fig. 15, the dotted lines indicate the meridians during convergence.)

In order to determine whether or not by subjective tests there is dynamic astigmatism produced in my left eye by simultaneous convergence and accommodation, and whether this bears any direct relation to the corneal asymmetry similarly induced, during three years I have proceeded as follows: With my correction, +0.75c. ax. 105 degrees, before this eye, the right covered, I regard an astigmatic chart and tangent scale at 6 meters. The dial lines appear equal and clear; exophoria 2 degrees. Now, placing a minus 3.00 D. sphere before the left eye and cylinder, and by a strong effort of accommodation overcoming the induced hyperopia, esophoria of 18 to 20 degrees is induced (9 to 10 degrees

12. Norris and Oliver, vol. iv., pp. 430, 431.
13. Ophth. Rev., vol. iv, p. 354.

of actual deviation, equivalent to convergence on a point of close to 8 inches). The chart lines 30, 45 and 60 degrees now alone appear distinct, and all the lines are equalized by +0.50 cyl. axis 135 degrees, indicating either a decreased relative curvature in the corneal meridian 45 degrees, or an increased one in meridian 135 degrees. The result of this experiment never varies, and it proves conclusively the production of dynamic astigmatism due either to accommodation or convergence, or both. Apparently, there is a direct relation between the corneal astigmatism produced in the left cornea by both objective and subjective experiments (Fig. 14).

The inclination of the principal meridians in my own eyes can not be explained by the outward physiologic torsion, which, according to Le Conte's laws, occurs in horizontal convergence from the primary position; for experiments show that this outward torsion of my eyes, converging to 8 inches, amounts to only 3 degrees, whereas, as seen in Fig. 14, the outward inclination of the nearly vertical meridians amounts to 10 and 15 degrees, while the nearly horizontal ones actually incline inward. There is, therefore, a distortion of the corneæ, and this, I believe, is due to pressure during convergence by the superior, inferior and internal recti. This pressure is quite as great in marked esophoria of accommodative origin.

In concluding this paper, I insist that dynamic astigmatism is of practical clinical importance, and the gist of my demonstration is a plea to consider in many cases the total refractive error in doubt until time, cycloplegic's rest, aided if necessary by the hypodermic use of hyoscin hydrobromate and bromids or other sedatives, with patient "fogging" at times, has eliminated all dynamic contractions. The condition is frequent, not rare, and failure to recognize it often accounts for the discrepancies in the refractive findings of competent ophthalmologists.

590 Sutter Street.

DISCUSSION.

DR. WILLIAM CAMPBELL POSEY, Philadelphia, declared that the paper offered a satisfactory explanation to him of his failure to relieve some three or four cases during the last two or three years. He had refracted each eye separately very carefully, under a mydriatic, and had established the fact to his satisfaction that the axis of astigmatism in each eye was, say, at 90 degrees. The lenses were then ordered with the cylinders at this axis. In a few days, however, the patients returned, saying that the glasses did not give comfort, and that they noticed that if the lenses were slightly tilted they gave better vision and comfort. The work was then gone over a second time, only to find that when tested monocularly the axis was at 90 in each eye; with both eyes open, however, and the lenses in position, it was found that the axis of the astigmatism in one of the eyes had shifted about 10 degrees. That this change was due to an unusual action of one of the extraocular muscles on the eye Dr. Posey thinks there can now be no doubt.

DR. D. DE BECK, Seattle, Wash., related that during college life he was perfectly well in every way, but suffered from asthenopic headaches and in the beginning of his medical studies he still suffered; when he began eye work he found that either eye could read 20/20 readily. His eyes were tested under atropin by his late teacher, Dr. Seeley, who found that he had a simple hypermetropic astigmatism of 1.50 D., with an inclined axis, 105 in the right and 75 in the left. With these he saw perfectly well and has worn that correction for twenty-five years. He also had a slight but well marked cyclophoria. On taking off these glasses at that time he would find that he had a vision of 20/70, but that in a little while he could work down the line until he could read 20/20. Putting on the glasses would for a few moments blur the vision and then he would again have 20/20 vision. In other words, he could adjust for the defect, but as years went by the adjustment became less and less perfect. This personal obeservation Dr. de Beck thought was in line with Dr. Eaton's experience.

DR. MARK D. STEVENSON, Akron, Ohio, said that when lenses having strong cylinders are prescribed, he rotates them in their frames until they are in the correct position before the eyes, so that the axis of each cylinder may correspond to one of the chief meridians of each eye. In doing so he has observed that the directions of the principal meridians sometimes change when binocular single vision replaces the vision of one eye. He has also observed this change during the act of accommodation.

THE INCIDENCE OF HEART DISEASE IN SAN FRANCISCO.*

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SAN FRANCISCO.

My object in writing this paper is to throw some light on the frequency of organic heart disease in San Francisco; on the relative frequency of the various forms; and on the factors that make the frequency what it is. In order to accomplish this purpose I have drawn on two sources of information. The first of these is the records of the General Medical Clinic in the dispensary of Cooper Medical College; and the second is the autopsies performed by my colleague, Dr. William Ophüls, professor of pathology in Cooper Medical College. In the medical clinic I have had opportunity for personal investigation of the cases concerned in the preparation of this paper, and know the facts to be as stated. As regards the autopsies, they were all made by Dr. Ophüls himself, who has kindly placed his personal records at my disposal.

Some explanation must be given at the outset as to what has been included under the term "heart disease." It is so often difficult to decide that the heart is really unsound, and that the heart symptoms of which complaint is made are not, in fact, due to disease of some other organ. Every clinical investigator must have certain rules for his guidance, and it is only fair to state first of all what rules have been followed in determining the presence of heart disease in the cases herewith reported.

First.—Although it may seem superfluous to state that no case has been diagnosed on symptoms alone, yet this statement is not superfluous, because such diagnoses are sometimes made.

Second.—No case in the group reported has been diagnosed on physical signs alone, especially not by the mere presence of murmurs. Nothing is more familiar to the teacher of medicine than the certainty with which a medical student rushes from the discovery of a murmur to the conclusion that valvular disease exists; while with increasing experience the murmur itself becomes less and less important as an indication of organic disease. I would not have it suspected, therefore, that diagnoses have been made in this way among the cases collected. On the contrary, so great has been the anxiety for conservatism in diagnosis, that no cases have been set down in the records as heart disease unless besides the murmur there was definite evidence present of alteration in the area of cardiac dullness, with symp-

* Read in the Section on Practice of Medicine of the American Medical Association, at the Fifty-sixth Annual Session, July, 1905.

toms and signs of broken compensation, either at the time of the first examination, or previous or subsequent to it. In other words, heart disease has not been considered to exist, unless it caused some, at least, of the well-known symptoms and gave rise also to the well-known physical signs.

Third.—Cases of cardiac neurosis have been entirely excluded. The patient that comes complaining of the heart is one of the most common visitors at any dispensary clinic; but rarely are such patients found to have organic disease of the heart. Naturally among the class who apply at an out-door clinic, there are many of the victims of various forms of dissipation and excess. Poverty, ignorance and vice do not always go hand in hand, but they are extremely frequent associates in the people with whom we have to deal. The various forms of cardiac neurosis—palpitation, tachycardia, heart pain, consciousness of heart action, have been observed even more frequently amongst our patients than real heart disease. But these false cases have been carefully distinguished from the true and all have been omitted in making up the list presented in this paper.

Fourth.—Still another point to be made clear is, that cases of hypertrophy or of dilatation of the heart, secondary to some other disease, have not been included in this list. For instance, in all the cases of chronic nephritis with secondary heart changes, no record has been made in this group of heart cases. Similarly with cirrhosis of the liver, pulmonary tuberculosis, the primary anemias and diabetes, no cases have been recorded as having heart disease, no matter what secondary changes were manifest in the heart. In other words, our effort has been to limit the inquiry to cases in which the heart was plainly the organ primarily diseased. The greatest difficulty has been encountered in the effort to determine the relation of arteriosclerosis to myocardial changes. Here it has been found practically impossible to decide whether one or the other process first took place, or whether they both developed simultaneously. In no case, however, has myocarditis been diagnosed without the presence of definite symptoms and physical signs referable to the heart, no matter what grade of arteriosclerosis was demonstrable in the peripheral vessels.

I. FREQUENCY OF HEART DISEASE IN SAN FRANCISCO.

After these preliminary explanations I pass to the consideration of the first question, viz.: How often does heart disease occur in San Francisco? I have looked over the records of 3,648 cases seen in the medical clinic of Cooper Medical College, during the five years from Jan. 1, 1900, to Jan. 1, 1905. Among these there occurred 135 of organic disease of the heart. Ninety-seven of these cases came to the clinic with the symptoms and signs of broken compensation. In the other thirty-eight compensation was fair at the time of examination, but the physical signs were nevertheless definite and there was a history of broken compensation on some previous occasion. Several of the cases came to the clinic repeatedly with attacks of broken compensation occurring again and again during the five years. The percentage of heart cases was therefore 3.7, or, in other words, out of every thousand who presented themselves for all sorts of medical diseases, thirty-seven were found to have unsound hearts.

The records of autopsies by Dr. Ophüls number 640. Among these autopsies sixty-one showed organic disease of the heart. This makes a percentage of 9.5; which means that out of one thousand cases of death from all causes, ninety-five bodies showed organic disease of the heart. The marked discrepancy between the clinical figure and the pathologic figure may be explained in several different ways.

First.—It is common for people with a slight degree of organic change in the heart to have no symptom of ill health referable to these changes; and to die from some other acute illness, when systematic investigation at autopsy reveals lesions not previously suspected to exist.

Second.—Slight changes in the structure of the heart valves and heart muscle may give rise to such dubious physical signs that the clinician may not recognize their presence, even though he has sought for them.

Third.—The total number of cases is very different in the two sets of records; and if the total number were equal in each, the proportion of heart cases might be more alike.

Fourth.—It must be remembered that the cases taken from the clinic records were all ambulatory; while Dr. Ophüls' autopsies were made almost entirely upon cases that died in the City and County Hospital, or in Lane Hospital. People who go to a dispensary clinic must of necessity be well enough to get about; but people who go to bed in a hospital, do so because they are too ill to be any longer about. Once in a hospital they are very likely to reach the pathologist, and once in the hands of a competent pathologist things are sure to be found out about them that were never known before. It is impossible, therefore, to draw any final conclusion as to the exact incidence of heart disease in this city, and as to where it lies between 37 per thousand as a minimum and 95 per thousand as a maximum. So far as I can find out, no previous attempt to establish this has been made, and this pioneer effort must of necessity give only an approximate estimate.

II. RELATIVE FREQUENCY OF THE VARIOUS FORMS.

In considering this point, a number of cases were naturally found where there appeared to be a lesion at more than one valve; but in these cases the diagnosis was always made of the lesion that seemed to predominate and to control not only the physical signs but also the clinical history. As was to be expected, the lesion most often met with was mitral regurgitation, of which there were sixty-five cases. Next in frequency came myocarditis, of which there were forty cases. While it is recognized that it is never possible to say with absolute certainty whether the myocardial change is fibroid or fatty in character, still in an overwhelming majority of the myocarditis cases there were associated changes in the vessels which spoke for fibroid change; and in only five did it seem likely that the condition present was a fatty degeneration of heart muscle. It has seemed to us that the proportion of myocardial disease to valvular disease is rather a large one, and this conviction based on clinical observation seems to be borne out by the pathologic findings in Dr. Ophüls' autopsy reports, as will presently appear. Third in order of frequency came aortic regurgitation, of which twenty-one cases were observed. All of them were typical and in two of them that died during the time of their attendance on the clinic, autopsy confirmed the diagnosis. Finally there were observed nine cases of pure mitral stenosis. I am convinced that this number does not convey a proper idea of the frequency of this lesion; but as no

patients under 12 years of age are admitted to this clinic, and as mitral stenosis is essentially a lesion of childhood, naturally the number herewith reported falls far behind the other forms. As it is, seven of the nine cases observed were in individuals under 20. No case was seen where a diagnosis of aortic stenosis could conscientiously be made.

Turning now to Dr. Ophüls' autopsy reports, out of the sixty-one cases of heart disease discovered, forty-three were cases of endocarditis and eighteen of myocarditis. As regards the orifices affected, the aortic alone was found involved eleven times; in one case no severe lesion, in three cases largely stenosis, and in seven cases insufficiency. The mitral alone was found involved ten times; in seven cases no severe lesion, in one case largely stenosis, in one case largely insufficiency, and in one case both. Both aortic and mitral valves were found involved simultaneously seventeen times. In the eighteen cases of myocarditis, fourteen showed partial obstruction of the coronary arteries by arteriosclerosis.

The observations made as regards the relative frequency of the various forms of organic heart disease are, therefore, not essentially different from those of observers elsewhere; except that there seems to be an unusual proportion amongst our cases of disease of the myocardium. This is directly attributable to the great frequency of arterial disease amongst the class of patients we meet in our clinic, a fact which accounts also, I may say in passing, for the remarkable frequency with which we observe aneurism of the aortic arch in San Francisco—a fact to which I venture to call attention at this time, without adducing statistics to corroborate the statement.

III. FACTORS INFLUENCING THE FREQUENCY.

(*A*) *Rheumatism.*—As one would expect, articular rheumatism has played a prominent part in the history of our cases who came with heart disease. Forty-nine in all had either had rheumatism at some time in their previous history, or were suffering from a subacute attack at the time of their visit. In a number of these there was the usual history of frequently recurring attacks; in others simply a history of one severe illness with a few or many joints involved. It is interesting to note the relation of rheumatism to the form of lesion present. Out of nine cases diagnosed as mitral stenosis, six had a positive history of rheumatism, usually of recurring attacks. Of the sixty-five cases of mitral regurgitation, thirty-three had an antecedent history of rheumatism. On the other hand, out of twenty-one cases of aortic regurgitation, only five had an antecedent history of rheumatism and out of the forty cases of myocarditis, only seven had ever suffered previously from rheumatism. Thus it would appear that while in San Francisco, as elsewhere, the acute infectious disease called rheumatism frequently leads to organic disease of the heart, it is the mitral valve that is most often left incapaciated, while the aortic much more frequently escapes and the myocardium suffers least frequently of all.

(*B*) *Arteriosclerosis.*—This is naturally the second great factor. It has been found present in practically all of the cases diagnosed as myocarditis, and in a large proportion of the cases of aortic regurgitation. It is recognized as a matter of course that arteriosclerosis may be manifestly present in peripheral vessels and yet, perhaps, play no part in the condition of the heart; and, on the other hand, that before changes can be discovered in peripheral vessels, advanced change may already have occurred in the coronary arteries and in the aortic arch. But two points are absolutely certain:

First.—The extreme frequency with which we observe arteriosclerosis in the clinic, as shown by thickened and hardened walls in the palpable peripheral vessels.

Second.—The fact that out of the eighteen cases of myocarditis which were found among Dr. Orphüls' autopsies, fourteen showed a greater or less degree of obstruction of the coronaries by arteriosclerosis.

Whatever the reason for it may be, degeneration of vessels is, without doubt, one of the most conspicuous pathologic conditions with which we meet in the medical clinic from which these records are taken.

(*C*) *Nationality.*—It is a significant fact that, out of the 135 cases, only forty-eight were of native stock—that is, born in the United States. What bearing this may have on the incidence of heart disease is not readily explained, but the fact remains that nearly two-thirds of our cases were of foreign birth. Nothing shows better than these statistics of a medical clinic how cosmopolitan is the population of San Francisco. Among the cases collected there were patients from Austria, Ireland, Germany, Sweden, Denmark, Italy, England, Canada, Poland, France, Switzerland, Finland, Roumania, Russia, West Indies, Belgium, Portugal, Norway, Hungary; while in the clinic, though not represented among the heart cases, we have frequent visits from Chinese and Japanese. Returning to the relation which foreign birth may bear to heart disease, the only explanation I can offer, based on my observation of these people as they come to us, is that the foreigners are afflicted not only by poverty, as all visitors at a free clinic must necessarily be, but are almost invariably filthy in their habits, addicted to the use of alcohol and tobacco, and ignorant of all proper conception of how they should live, of how they should eat, drink, work and house themselves in order to maintain health.

(*D*) *Occupation.*—It can be safely asserted that among our cases, no one occupation has predisposed more than another to heart disease; for almost every conceivable form of labor is represented among the 135 collected here. But it must be borne in mind, on the other hand, that only the laboring class are represented in this group, and that no information whatever is given by a public clinic as to the frequency of heart disease among the prosperous, whose occupation is entirely different from that of the class from whom these cases come. It is not likely that the occupation itself has so much to do with the incidence of heart disease as has the association of any hard work with bad hygienic habits, poor food, overindulgence in alcohol and other forms of dissipation. While I have no definite statistics to offer as to the frequency of heart disease in private practice, my impression is that cases are not so frequently met with among the well-to-do as among the poor; and not so frequently among those who earn their living by their brains as among those who have to earn their daily bread by the work of their hands. Nevertheless, the rich, the idle, and the brain workers have diseases of their own, even if they apparently escape their share of heart disease.

(*E*) *Sex.*—Only thirty-five of the cases were women, while one hundred were men. While the fact that the number of males in the group so largely exceeds the

females may be partly explained by the fact that the number of men presenting themselves for treatment at a dispensary clinic is always greater than the number of women, still there is no such disproportion in the attendance as there is in the number of these cases of heart disease; and the inference seems justifiable that in San Francisco, at least, heart disease is more common among men than among women.

(*F*) *Age.*—As is well known, there is no time of life exempt from heart disease, and our cases were found distributed among individuals of every age from 12 as a minimum to 81 as a maximum. During the various decades they occurred as follows: 12 to 20, nine; 20 to 30, sixteen; 30 to 40, seventeen; 40 to 50, thirty-two; 50 to 60, twenty-nine; 60 to 70, twenty-six; 70 to 80, six. Of the nine cases under 20, seven were mitral stenosis and two mitral regurgitation; of the sixteen between 20 and 30, ten were mitral regurgitation, two were aortic regurgitation, two were mitral stenosis and two only were diagnosed as myocarditis. Of the seventeen cases between 30 and 40, ten were mitral regurgitation, five were aortic regurgitation and only two were myocarditis. Thus it will be seen that all of the cases of mitral stenosis occurred under the age of 30 and the great majority under 20; while, on the other hand, out of the forty cases in all of myocarditis, only four were observed in patients under 40. The mitral regurgitations were found quite evenly distributed throughout all the decades, almost the same number for each ten years up to 70; which would seem to indicate not only that mitral regurgitation has no predilection for any particular time of life, but also that its prognosis is better than that of the other valvular lesions. Of the aortic regurgitations only one-third occurred under the age of 40, and two-thirds between the ages of 40 and 60; which would seem to indicate the part played in the production of this lesion by arteriosclerosis. This, indeed, is the most significant fact that stands out above all others in these records—the predominance of arterial disease; and advanced years in themselves lead to heart disease only as they first lead to changes in the coronary arteries, or in the aortic arch and the valves that guard the orifice of this great vessel.

CONCLUSIONS.

1. Heart disease is a common ailment in San Francisco, as it is in all large cities.

2. Among valvular troubles, the form most commonly met with is mitral regurgitation; second comes aortic regurgitation, and, third, mitral stenosis, while aortic stenosis is undoubtedly a rare affection.

3. Myocardial disease is frequently found. The factors in its incidence are those commonly supposed to cause arteriosclerosis; and the latter condition is even more often seen than myocarditis itself.

DISCUSSION.

DR. W. OPHÜLS, San Francisco, said that the number of cases examined at postmortem was rather small, and a comparatively small number for statistical purposes. He was struck with the large number of septic endocarditis cases. Nearly all of these cases were diagnosticated clinically as cases of chronic rheumatism with heart lesions and Dr. Ophüls thought that the cases of rheumatism, so-called, that lead to severe lesions of the heart valves were, in the large majority, more properly speaking cases of sepsis. How frequently these heart lesions follow in instances of rheumatism, if we want to acknowledge the existence of such a condition not due to an infection with ordinary septic bacteria, is another matter. It can not occur very frequently. So that it is presumable in the course of a disease with the clinical picture of polyarticular rheumatism, but with severe lesions of the heart valves, that the condition really is a septic one.

DR. JAMES J. WALSH, New York, thought, with regard to the origin of rheumatic endocarditis, that there is a definite change of opinion among medical men about to come that is worth while noting. At the present time it is generally accepted that simple, acute articular rheumatism is very frequently followed by valvular heart disease; on the other hand, it is generally acknowleldged that simple, articular rheumatism does not leave any marked evidence of disease in the joints. One of the pathognomonic signs of acute articular rheumatism is that it leaves no mark after it. Whenever a chronic arthritic condition remains there is more than a suspicion that the original disease was not simple acute rheumatism, but either artaritis deformans or acute arthritis, due to some other infection beside that which produces true rheumatism. Affections of the heart valves are extremely common in septic conditions of all kinds. There is scarcely any form of microbe that gets into the circulation but will not produce an affection of these delicate structures. The heart valves are, after all, joints in the tissues, that is, they represent portions of the tissues covered by serous membranes in order that they may move over one another without friction and without adhesion. Since ordinary acute rheumatism when uncomplicated does not leave any mark on the other joints in the body, it seems probable that it also does not leave any mark on the heart; at least, not nearly in the large proportion usually stated. When there is a so-called rheumatic endocarditis it is probable that there has been some secondary affection complicating the simple rheumatic arthritis. This point of view can not but be helpful for diagnosis and prognosis.

DR. CHARLES ROLLINS GRANDY, Norfolk, Va., reported that his experience with heart disease among the negroes has been rather different. Heart disease among the negroes is very common, while acute rheumatism is seldom seen. The negroes have various other diseases which they call chronic rheumatism, but which are probably nervous affections, etc. Many cases of aortic valve murmurs or even double valve murmurs occur. There may be an aortic direct murmur, although at autopsy there will not be found any closing of the valves. Men who do heavy work have dilated hearts, hypertrophied hearts, with a leak at the mitral or other valves; these are some of the cases that come to Dr. Grandy for treatment in Norfolk. In probably the majority of them there was a strain of the valve. They were young men and Dr. Grandy was able to note the blood pressure and the arteriosclerosis.

ACUTE DIFFUSE SUPPURATIVE PERITONITIS.*

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Many men of many minds have written about peritonitis. The theme is old but not exhausted—not while surgeons are reporting 100 per cent. of mortality. I shall confine myself to a discussion of the acute diffuse suppurative form of the disease, and will consider especially the treatment. For etiology and classification I will refer to the publications of Senn[1] and Bayard Holmes,[2] whose monographs are exhaustive and scholarly.

In the study of this subject my purpose has been to secure for comparison the experiences, methods and opinions of a considerable number of surgeons. This I have undertaken by correspondence and by some references to literature. Fifty letters were addressed to surgeons in various sections of the country, information being sought on lines suggested by the following questions:

* Read before the Indiana State Medical Association, June 8, 1905.

1. Senn.: Journal A. M. A., Sept. 4, 1897.
2. Holmes: Illinois Med. Jour., 1904, vi, 499-515.

1. Do you make it a rule to operate on acute diffuse suppurative peritonitis?
2. If not, what are the contraindications?
3. On how many cases have you operated, and with what mortality?
4. What is your method of operation and treatment?
5. Do you ever refuse to operate? If so, when and why?

Free discussion was invited. Twenty-five answered—some in detail. A dozen sent courteous regrets. From the remainder no answers were received. Many of the letters received were scholarly and instructive. I wish I might publish them in full, but that is manifestly inexpedient. I, therefore, give you briefs and excerpts as follows:

VAN BUREN KNOTT, Sioux City, was among those who gave detailed information as to his methods of treatment. He always operates unless patient is moribund. He has kept records only since 1902. Since that date he has operated on 19 cases, with 17 recoveries and 2 deaths. He employs the median incision, and at once repairs any leak or diseased part that may exist. Through a two-inch incision above the symphysis he places a tube one and one-half inches in diameter, carrying a gauze wick to the bottom of the pelvis. In females a similar tube without the gauze wick is placed in the cul-de-sac. Gallons of hot salt solution are used to flush the abdomen, enough of which is left in to fill the cavity entirely. With an additional drainage tube in the pelvis similar to the first, but without the wick, the patient is raised to the Fowler attitude while yet on the table, transferred to the bed and kept in this position. Through this plain tube in the pelvis he pumps out, every two hours, such excess of fluids as are not carried off by the wick. This is done for 24 hours. He thinks by leaving in the abdominal cavity a large amount of the saline solution a strong current is established toward the lower pelvis.

D. N. EISENDRATH, Chicago, operates on all cases where diagnosis has been made during the first 24 to 72 hours. As contraindications, he mentions extreme sepsis as shown by a pulse of 180 to 200, excessive distention of the abdomen which denotes a complete septic paralysis of the gut, as well as constant vomiting. He thinks these latter cases, however, are those in which a diagnosis has not been made until the fourth, fifth or sixth day after the onset of perforation. Prior to his adoption of the Fowler position, he reports 7 cases with a mortality of 100 per cent. Since using the Fowler position he has had 3 cases, all of which recovered. He washes the abdominal cavity with three or four gallons of hot salt solution and inserts a Mikulicz (or umbrella) drain of plain gauze. Where the drain goes through the skin it is surrounded with long strips of loosely folded gauze, which is frequently changed within the first few days after the operation.

JOSEPH R. and THOMAS B. EASTMAN, Indianapolis, make it a rule to operate on all cases unless moribund. They report 7 cases with 1 death. Their method is celiotomy, lavage, very gentle manipulation of the intestines in search for abscess or perforation, and tube drainage from bottom of pelvis, with patient in Fowler's position.

GEORGE TULLY VAUGHAN, Washington, D. C., reports 16 cases, with 4 recoveries and 12 deaths. He uses irrigation and drainage and refuses to operate only when patient is moribund.

JOHN A. WYETH, New York, does not operate on all cases. In cases of seemingly diffuse mild peritonitis, progressing slowly from the first indications of the disease, he adopts the Fowler position, gives calomel and flushes the colon from below with salines. He reports two cases within two years of general diffuse peritonitis in children which had developed in connection with colitis due to intestinal indigestion, and both were relieved, without operation, by this method. Rapidly developing general peritonitis, from symptoms of gangrene of the appendix or perforation, he says, require operation, and the seat of infection should be sought out and removed. He flushes with sterile water 100 to 105 degrees, with a long tube, beginning above the liver, spleen and stomach, and underneath these organs, and around on either side, carefully, under high pressure, using volumes of water until the fluid comes out clear. In women he opens the cul-de-sac and drains, and in men through an opening above the pubes he puts in a pelvic pack.

ROSWELL PARK is among those who take a pessimistic view of operative treatment. He says: "I have had such a small measure of success in attacking diffuse suppurative peritonitis that I avoid operation on it if I possibly can. I feel that the contraindication is the fact of its being suppurative and diffuse."

J. F. BINNIE, Kansas City, says that operation is the only logical method of treatment, but that he has seen more cases recover unexpectedly without operation than with. He is convinced that almost all cases where the abdomen is much distended and diffuse suppuration is present will die, no matter what the treatment.

JAMES E. MOORE, Minneapolis, and JOHN P. ROBERTS, Philadelphia, also incline to this view.

PARKER SYMS, Philadelphia, makes it a rule to operate on diffuse cases. He says: "I believe there should be a careful distinction made between diffuse and general acute suppurative peritonitis. I believe that general acute suppurative peritonitis is fatal in 100 per cent. of cases, no matter what plan of treatment is employed. I believe diffuse peritonitis should give satisfactory results if properly operated on. Of course, there will be a pretty high mortality rate. My method is removal of the original focus, sponging out of the sero-pus and careful drainage with gauze and rubber tissue. I use peroxid of hydrogen locally. I do not believe in flushing. In the routine after operation I employ the physiologic rest to the stomach and alimentary canal as prescribed by Ochsner. I often prescribe the upright position suggested by Fowler."

L. L. MCARTHUR, Chicago, operates except in the moribund state. He reports 100 cases, out of which he saved 23. He uses irrigation, pelvic drainage and the Fowler position.

This plan of treatment is endorsed by ROBERT G. LECONTE, B. F. CURTIS and DE FOREST WILLARD, Philadelphia; CHAS. A. POWERS, Denver, and H. L. BURRELL, Boston.

B. F. CURTIS, Philadelphia, also recommends the ice coil and opium.

H. L. BURRELL, Boston, reports "at least 100 cases," and recalls "a few instances in which recovery has occurred." Occasionally when in doubt as to how diffuse the peritonitis is, he uses Ochsner's treatment for a few days.

NICHOLAS SENN, Chicago, has no fixed rule for operating. He selects his cases. He claims as contraindications, subnormal temperature, pulse 150 or more and great abdominal distension. He could not state the number of cases on which he had operated. His method consists of free drainage, flushing, and, if necessary, multiple incisions.

W. J. MAYO, Rochester, Minn., reports about 30 cases, with at least 50 per cent. of recoveries. He advocates quick abdominal incision and pelvic drainage with the patient kept in a sitting position for four or five days. Contraindications are general sepsis, leaky skin, quick pulse and cyanosis.

R. C. COFFEY, Portland, Ore., makes it a rule to operate on all cases, except in extreme shock, or in which the condition has existed for several days and the patient is improving or is growing no worse. His treatment consists chiefly in carefully applied capillary drainage in sufficient quantities absolutely to dry the abdominal cavity within an hour or less time. For this purpose he has used more than 100 drains in wicks the size of a finger in extreme cases. In addition to drainage, he has great faith in anti-streptococcic serum or streptolytic serum. He commends Ochsner's method of starvation and stomach washing in these cases.

C. H. MAYO, Rochester, Minn., operates if due to rupture of viscera; also in the earlier stage of ruptured abscess if patient is reacting. He does not operate if patient is in the second period of subnormal temperature following the shock of rupture. In case of a ruptured viscus, the source is found and cared for, foreign material removed by irrigation, large

glass drain in the pelvis, patient in sitting posture. If due to ruptured abscess, source of abscess is not sought for unless condition of patient is fair. No irrigation of pus derived from tissue or blood. He gives salines by rectum and occasionally subcutaneously.

John Young Brown, St. Louis, reports about 50 cases with a mortality of about 15 per cent. He operates on all cases, unless suffering from profuse general sepsis. He deals first with the primary source of infection, then "stabs" above the pubes, puts a large glass tube in the cul-de-sac and places patient in an exaggerated Fowler position. He has stopped irrigating and handles the viscera as little as possible. He believes that the hitherto high mortality rate has been largely due to the attempts of surgeons to do too much in cases of widespread peritoneal infection.

J. B. Murphy, Chicago, has a series of 24 operations, with only 1 death. He protests against irrigation and handling of viscera. His method consists of tube drainage in pelvis, Fowler position, proctoclysis, and antistreptococcic serum.

Thomas B. Noble, Indianapolis, employs a similar technic. He says that one can never tell what case is hopeless. He refuses to operate only when patient is dying and thinks then under local anesthesia some may be saved. He reports 5 cases operated on with only 1 death.

Byron Robinson, Chicago, also employs incision and drainage, with incision into the colon for relief of distending gases. He says: "I operate on any peritonitis which does not appear to check by anatomic and physiologic rest."

Now let us analyze these replies:

To my first question seventeen said "Yes." Seven gave affirmative replies, with qualifications. One avoids operation if possible.

Question 2 developed the statement by fourteen writers that no contraindication to operation should be considered except the moribund state. Nine gave symptoms which virtually imply the same condition, while two did not answer the question.

In answer to Question 3, statistics were supplied by twelve, a few of which were estimated. There were reported 374 cases, with a total of 232 deaths. This gives a total mortality of a fraction over 62 per cent.; a high death rate to be sure, but it does not bear out the opinions that all will die, no matter what treatment is employed.

My fourth question pertained to methods, and it developed that 15 were in favor of irrigation, while 10 opposed it. The Fowler position was advocated by a total of 17. It was not mentioned by the others.

The answers to my fifth question tallied very closely with replies to my second.

In going over the methods of treatment we find that operation is advocated in nearly every instance as the only rational procedure. The technic, however, varies considerably: prognostic opinions likewise. We find here the optimist, who believes that nearly every case ought to be saved. We are not without the pessimist, who thinks all will die. And, as usual, we have intervening shades of opinion. Is there anything in these reports to account for such variance in belief? Let us question them still more critically.

Points on which there is no contention are: Free drainage and the Fowler position. True, the methods of drainage are somewhat at variance, but all are primarily agreed on its use, and all place it in the pelvis, and in other regions as indicated. Irrigation is favored by the majority, but those who use it seem to have the highest mortality. They report, altogether, 252 cases with 199 deaths. This is a mortality of 79 per cent. Where irrigation was not employed 92 cases were reported, with a total of 18 deaths—a mortality of less than 20 per cent. This looks significant.

I am aware that there is liability to error in these figures. Other factors may have figured in the cases to some extent. Still, the difference in death rate is so striking that it challenges our attention, and needs an explanation. I know that some operators report success with irrigation. Levings[3] recently reported 10 cases operated on in 10 months, with 9 recoveries, and in each case he flushed the abdomen with acetone solution, 1 to 10,000. Note, however, that he applied it *through the drainage tubes*, without handling the viscera.

Among English surgeons I find C. A. Ballance[4] warning against the practice of irrigation and handling the viscera. He thinks the heavy death rate in the past has been due to these methods. Also, in the Erasmus Wilson Lectures on peritonitis, Dudgeon and Sargeant,[5] who investigated a series of cases at St. Thomas' Hospital, report 119 cases of diffuse peritonitis resulting from perforations in appendicitis. Of this number 100 were treated in the ordinary way by lavage with sterile water or salt solution; 80 of the patients died; the remaining 19 were sponged locally, and drained without flushing, with 10 deaths. This gives 80 and 53 per cent., respectively, for the two methods. None of the cases were selected, save that a few of the latter were given this conservative treatment because they seemed hopeless. The writers unhesitatingly endorse the method which gave the most satisfactory results.

There is another element in these reports which undoubtedly modifies statistics. I refer to the laxity in the use of the term "general" peritonitis. Senn directed attention to this in 1897. One or two of my correspondents have emphasized it, and I find a note of warning in the excellent lectures above referred to. Every case of peritonitis at first is local. When it is not limited by adhesions these writers[3] prefer to call it "diffuse," the term "general," or "universal," being reserved for cases in which the entire peritoneum is involved. They claim, also, that no accurate opinion can be formed at the time of operation, as to whether a case is diffuse or general.

If it be true that the method which omits flushing and handling and sponging gives the best results, as it seems to do, what are the reasons therefore? Let us examine the processes by which nature combats the infection. They are:

1. A serous exudate.
2. A fibrinous exudate.
3. Hyperleucocytosis.
4. Route of absorption.
5. Anatomic and physiologic rest.

1. The serous exudate serves to dilute the toxins of the infections and perhaps has a tendency to neutralize them with antitoxins. We may assist in this dilution by flushing, but there is a better way. Water introduced slowly by rectum will accomplish the purpose without traumatic effect on the peritoneum. It also favors elimination. Murphy[6] says eighteen pints of salt solution may be introduced into the rectum in twenty-four hours, and retained if introduced slowly under low pressure (one foot elevation). This I consider a most important element in treatment.

2. We all know something of the benefit to be derived from a fibrinous exudate. It tends to wall off the infection and to change a diffuse into a circumscribed inflammation. It helps to protect the endothelial coat

3. Levings: Clin. Review, Chicago, 1904-5, xxi, 161-170.
4. Ballance: Lancet, Lond., 1904, ii, 1195-1200.
5. Dudgeon and Sargeant: Lancet, Lond., vol. i, 1905, 617-625.
6. Murphy: Proc. Med. Series, 1903, November, 282.

from the destructive effect of toxins. A blistered or denuded peritoneum is a distinct menace to the life of the patient for the reason that it allows absorption to take place directly into the blood stream. Dudgeon and Sargeant[6] observed that the *Staphylococcus albus* was the first organism to appear in peritonitis and the last one to disappear. It was always associated, when present, with a fibrinous deposit. They believe it has an influence on the formation of fibrin, as well as with the attraction of leucocytes into the field. The leucocytes produce a turbid appearance in the fluid present, and the surgeon has been trying all along to remove this creamy substance, which really is nature's bodyguard, fighting the infection. The point is, let the fibrinous exudate alone. How differently from the recommendation made to the French Surgical Congress by Demons[7] a few years ago, viz., to scrape the entire surface of the intestine.

3. Hyperleucocytosis, generally, is an expression of the natural resisting power of the individual, as compared to the amount and character of toxemia present. It is favored by such measures as conserve the patient's energy, and the fact that leucocytes are present in the exudate in large numbers is no indication for flushing. You can not remove pus from the peritoneal cavity without breaking up the fibrinous deposit, uprooting the endothelial cells and producing multiple atria of infection. Pus goes in the line of least resistance. Remove the tension, give it an outlet and leave the rest to nature.

4. Robinson[8] and other observers have demonstrated that the place of greatest absorption is the diaphragmatic pleura; also that absorption takes place primarily through the lymphatics, chiefly in the direction of the thorax. Muscatello, in his experiments on dogs, showed that the upright position retarded but did not prevent absorption by this route, and, furthermore, there was no evidence of absorption by any other channels. The abdominal organs after five and one-half hours contained none of the reagent used in the experiment. This explains the efficacy of the Fowler position after operation. Absorption is delayed and time is gained for the patient, and time is an important element in the fight.

5. Nature enforces rest by inflicting the patient with pain. The normal peritoneum is practically without pain sensation. When it is inflamed the pain is terrific. As a result the diaphragm and other muscles are fixed; the parts are placed under enforced rest. Robinson[8] says that the diaphragm acts as a force pump, sucking up the fluids from the peritoneum during respiration, and forcing them onward through the lymphatics. If this be true, rest is greatly to be desired. It also tends to limit the spread of infection throughout the peritoneal cavity, for it must be remembered that diffuse inflammation is not of necessity general.

To sum up, I believe the indications for treatment are:

1. Early operation—and it must be remembered that this implies an early diagnosis. Do not wait for shock, which is a symptom of overwhelming infection. Learn to recognize the early symptoms as stated by Murphy:[9] "Pain, nausea and vomiting, localized tenderness, circumscribed flatness on piano percussion, elevation of temperature and hyperleucocytosis, in the order named." I repeat it, operate early.

2. Method—simple incision, with simple drainage, placed in pelvis and such other fossæ as seem to require drainage. Perforations should be closed, and appendix removed if it be the offender, provided these things can be done without too much handling of viscera.

3. Fowler position to retard lymphatic absorption.

4. Physiologic salt solution by rectum, one and one-half pints every two to four hours for twenty-four to forty-eight hours.

5. Antistreptococcic serum in suitable cases in hope to combat the effect of toxins absorbed.

7. Demons: Trans. French Surg. Cong., 1890.
8. Robinson: "The Peritoneum." Part 1, 288.
9. Murphy: Journal A. M. A., 1903, April 11.

TREATMENT OF CONGENITAL DISLOCATION OF THE HIP.

WITH REPORT AND EXHIBITION OF CASES.*

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It is not my intention to give an elaborate paper on the treatment of this disease, but simply to go over briefly the methods used in these cases which are reported. The fact that it is necessary to wait for many months, or even years, before the final result is known, and the further fact that only a few years ago this disease was relegated to the surgical waste basket as being incurable, places our knowledge of the result of treatment of it at the present time in a more or less uncertain condition.

Many objections have been raised against the manipulative method as practiced by Lorenz and his followers. Serious complications, such as paralysis, fracture of the bones, rupture of the blood vessels, gangrene, and loss of limb, have been too frequent; and the final results are not by any means perfect. Ankylosis may occur, complete relapse is comparatively frequent, and anterior transposition is so common as to be almost the rule.

The operative technic here followed has been that practically as given by Royal Whitman[1] and J. Jackson Clarke.[2] The tissues on the inner side of and anterior and posterior to the joint are, in turn, stretched until sufficient relaxation for reduction is produced. This result has usually been accomplished when the trochanter can be drawn down to Nélaton's line. Reduction is attempted by forced abduction of the thigh, which is at the same time completely flexed on the abdomen and rotated inward. Either the hand of the operator or a wedge may be used as a fulcrum behind the trochanter. After reduction the anterior fibers of the capsule are stretched and the plaster cast applied. Only in an easy case, however, would the operation be completed at one time.

The structures with which we have to deal in these operations are frail, while the leverage is great; consequently special care is necessary to avoid injury. After a moderate amount of manipulation of the tissues and a few gentle attempts at reduction, the hip is placed in a cast in a position of abduction. After two or three weeks, the cast is removed and another attempt made at reduction. At this time, the adductors will be found well relaxed, and most of the manipulations will be required on the posterior and anterior muscles, especially the tensor fascia femoris. The same method, however, as previously practiced, is repeated again at this time. If, after three or four attempts, reduction can not be accomplished, it is undoubtedly wise to resort to open

* Read in the Section on Surgery and Anatomy of the American Medical Association, at the Fifty-sixth Annual Session, July, 1905.
1. Orthopedic Surgery, 1903.
2. The Practitioner, March, 1903.

incision. When reduction has been secured, the cast is changed about once in two months, or more frequently if much soiled or broken, and at the time of such a change a radiograph is taken, and the hip gently moved in different directions, avoiding adduction. This gentle, repeated manipulation should eliminate almost completely such complications as result from fracture of bones and laceration of the soft tissues. The frequent dressing, with *x*-ray picture, keep the surgeon posted as to the progress of the case, and the tissues about the joint are also kept in better condition. On account of the frequency of relapse, treatment in the cast, even in favorable cases, is continued for at least one year after final reduction. The following cases are reported:

CASE 1.—R. R., female, born in February, 1901, began to walk in August, 1902, when the limp was first noticed by her parents. In April, 1903, the child had empyema, and after recovery from this the limp was more noticeable. She came under my observation in October, 1903, with congenital backward dislocation of the right hip. The shortening was three-quarters of an inch. My friend, Dr. Joseph C. Bloodgood, of Baltimore, who has given me much valuable advice and assistance with all these patients, had charge of this one, and, with my assistance, manipulated the hip for twenty minutes without securing reduction. A cast was applied with the limb in abduction. This patient was treated until the present time under the direction of Dr. Bloodgood, and it was at his suggestion that the repeated gentle manipulative method was used. In January I manipulated this hip the second time under anesthesia and very easily secured apparent reduction. The femoral head could be plainly felt anteriorly, and the hamstring tendons were contracted so that it was impossible to straighten the leg. The *x*-ray, however, cast a gloom over my hopes by portraying the fact that the bone was really in a position of anterior transposition, where it has since remained. The cast was changed about once in two months until January, 1905, when it was replaced by an external hip splint, holding the leg in slight abduction. In July, 1904, the cast was removed and the patient placed in bed, with slight extension, for one week. She is now walking, without any support, a portion of the time, but with a moderate limp. This limp may be partially habit, as the splint is still worn most of the time. There is free movement, with about three-eighths of an inch shortening.

CASE 2.—F. C., female, born in September, 1899, was referred to me by Dr. L. R. Dawson in June, 1903, with the diagnosis of double backward congenital dislocation of the hips. In October, 1903, Dr. Bloodgood assisted me in manipulation of her left hip, and, although the reduction was not accomplished, a cast was applied with the limb in abduction. In January both hips were manipulated, the left giving clinical signs of reduction, while the right was still unreduced. Early in February an anesthetic was given, and the left was found in its former position of backward dislocation, and I was unable to replace it, although apparently the muscles were thoroughly relaxed. At this time the right hip was reduced with audible thud and jerk and gave other clinical signs of reduction. The *x*-ray showed that it was in perfect anatomic position, and it has remained so until the present time. The cast was applied with both thighs in abduction, and again in March an anesthetic was administered and the left hip again apparently reduced after great difficulty. The cast was removed, however, two months later, and it was again found in a dorsal position, and three or four efforts after this failed to change its location. In October, 1904, after performing tenotomy of the adductors and the tensor fascia femoris, and still failing to accomplish reduction, I operated by open incision, using Lorenz's modification of Hoffa's method. On opening the capsule, practically no fluid was found; the head of the bone was eroded, the neck was at right angles to the shaft, the ligamentum teres absent, and the capsule contracted at the head of the femur. It was impossible to find the joint cavity until a more careful examination revealed the fact that the capsule was stretched across the acetabular cavity and firmly adherent around its rim. The capsule was freed by dissection from its adhesions to the acetabulum, which was found to be very shallow and contained little or no débris. The bone was replaced and one or two catgut stitches placed in the capsule and the external wound closed without drainage. The wound united, apparently without infection, although the union was slightly delayed in one part on account of the stitches not being near together, causing a small superficial granulating surface. One month after this operation, the head of the bone was again found in a dorsal position, but was very easily reduced. It was then put up with increased abduction and has since remained in place, while the abduction has been gradually decreased.

In February, 1905, a radiograph showed an apparent separation of the lower part of the left sacroiliac joint, and also a change in the ilium opposite the acetabulum, which looked very much like a fracture, but was not so considered by Dr. C. H. Thomson, who has taken most of these radiographs, although he thinks the bone was pushed in a little. This occurred after a manipulation so gentle that the child, without anesthesia, did not cry. The cast was removed in March and the patient kept in bed and the left hip manipulated to try to loosen the adhesions. In May she was allowed to walk, with a brace for slight abduction of the right hip. When the first apparent reduction was obtained by the manipulative method, it was evidently with two folds of the capsule between the head of the bone and the cavity, and there is a question in my mind as to whether these manipulations and the replacing of the bone in that condition did not tend to cause the adhesions of the capsule which were found. At the present time, the right hip has good motion and is apparently in good position. The left hip is in good position, but with limited motion with slight abduction and one-quarter of an inch shortening in comparison with the right. The stiffness will probably disappear, as there is no evidence of bony ankylosis.

CASE 3.—L. K., female, was born in October, 1901, and began to walk October, 1903, and was then noticed by the parents to have marked lordosis and a peculiar gait. In June, 1904, the late Dr. F. H. Coe saw her and made a diagnosis of double backward congenital dislocation of the hips and referred her to me for treatment. She was operated on by the manipulative method under anesthesia July 11. The right hip was apparently reduced after manipulation of forty-five minutes. The left one was reduced to anterior transposition after manipulation of about thirty-five minutes. These were comparatively easy to reduce, but still easier to displace. The *x*-ray showed very imperfectly formed acetabular cavities, and also showed that neither reduction was anatomically perfect, but both anterior and a little above. In both cases the head of the femur could be felt in front, and the ham-string tendons showed apparent shortening. Even with this apparently moderate manipulation, there was considerable swelling and ecchymosis about the vulva. September 6, the cast was changed and the left hip again found on the dorsum, and an apparently perfect reduction was obtained, and it still remains in that position. The right was probably in a supracotyloid position and was brought down on a level with the socket, but could only be kept there by bringing the thigh above a right angle with the abdomen with extreme abduction. At the next dressing, and since that time, it has been found in a position of anterior transposition. This patient is still wearing a cast.

CASE 4.—C. C., female, aged 17, born in Seattle, after difficult instrumental labor, came under my observation in October, 1903, for congenital dislocation of the left hip. There was shortening of 2¾ inches, which could be reduced to 1¾ inches by traction. Abduction was very much limited and there was marked tilting of the pelvis. Her only symptom was a moderate but characteristic limp, which was lessened by the use of a cork sole. She seemed rather proud of the fact that she could kick higher with this foot than with the other. No treatment was advised. She was married a few weeks later, and no further reports have been obtained.

CASE 5.—M. M. O., aged 23, married, came to me in June, 1904, about five months' pregnant. The history was that she tired easily about the hips and had more or less pain in the right. This trouble dated back four years, when, after riding astride a horse, she felt a catch in her right hip. Previous to

that time, there was no pain or discomfort, although, she said, she had always walked like a duck. On examination, a double backward congenital dislocation was found, and this diagnosis was verified by the *x*-ray. The nature of her deformity had not been previously discovered. She was delivered October 1, at full term, after ten hours' easy labor. Her version of her present condition is that her right hip tires more easily, is more painful and has increased in size since the birth of her child.

Results in the treatment of this disease necessarily vary greatly with the age and condition of the patient. These eight hips here reported give two anterior transpositions with three anatomically perfect results, one of which was obtained by open incision and resulted in limited motion, which, however, may not be permanent, as the treatment can not be considered complete in any of the five hips treated. The permanent functional results, which are of the greatest importance, will only be known months, or possibly years, later. The three adult hips, in which no treatment was advised, showed a comparatively small amount of disability. The method here used of repeated, gentle manipulation, has the advantage of little danger, and, in case of failure to maintain and accomplish reduction by this process, the patient is better prepared for the method of open incision, which must be resorted to in a certain proportion of cases in order to accomplish the best results.

DISCUSSION.

DR. S. J. HUNKIN, San Francisco, thought it the duty of every surgeon to replace the hip joint in the quickest and easiest manner possible, let that method be according to the Lorenz plan, the Hoffa maneuver, or by an open incision. Dr. Hunkin considered that often it is better surgery to make an incision, open the capsule and put the head of the femur into the acetabulum under the eye, than to make severe traumatism and excessive ecchymoses, in a blind attempt. There is usually not so great difficulty in young children in getting the head of the femur to the site of the acetabulum as there is in maintaining it there. Often there is no acetabulum or only a small, shallow, smooth, slightly concave surface, and under such conditions, one may have to go back to the old Hoffa open operation, and scoop out a cavity big enough to hold the head. Dr. Hunkin remarked that the last speaker seems to have had some difficulty in preventing posterior reluxation, and he thought that due to the position maintained in the splint—the leg must be abducted and maintained at or posterior to the horizontal plane of the trunk. From this position an anterior transposition may result, but not a posterior reluxation. In addition to the usual splint Dr. Hunkin makes a later splint, open at the side and removable, which the patients wear at night for a year after they are free by day. This forces the limb into the extreme postoperative abducted position, for twelve hours a day, and a smaller percentage have relapsed since he has followed this plan.

DR. DEFOREST WILLARD, Philadelphia, said that Dr. Willis' results correspond very closely with those of others who have attempted this operation. A certain number of young children will be benefited and a considerable number will be found after a time in a condition of ante-transposition. Some will be failures, which is the experience of all who have attempted it. If Dr. Willis' plan of gentle manipulation can replace the more forcible one it will be a great advance, but many accidents had resulted. As to the anterior transposition, especially in children over 7 or 8, where the bone has been put into a new position after the muscles have accommodated themselves to the former position, even if it be a dorsal one, Dr. Willard does not believe these cases are benefited in the least degree. They may walk with a little less lordosis, but they have not as good balancing power. They can not perform as good labor as if the head of the bone was lying in its original position. In the latter case they may walk badly, but they are stronger and better prepared for their work, which is important, especially with men. As to the open operation, it will likely result in a stronger hip, although we are very likely to have ankylosis. There is a danger in the open operation about which we should warn the patient in advance. As to the prognosis; from the newspaper reports the public expects that all these cases are going to walk as well as a well individual, but any surgeon who gives this idea to parents is unwise. We must be cautious in our prognosis, and we should not attempt the operation in too young children. Dr. Willard said he had not had much trouble in getting the hip back to the site of the acetabulum, where there is any acetabulum, but the majority of cases have none. The parts are all malformed and one can not make the head remain in position. It may stay there six months or two years, but some time or other the child must walk, and then comes the time when it will slide out of the acetabulum. It is simply a question of having a normal acetabulum before reduction should be attempted. If we have only a tea saucer, instead of a teacup, it will surely slide out again, and there is where the great difficulty arises.

DR. C. O. THIENHAUS, Milwaukee, Wis., said that while it has been generally accepted by the writers on congenital dislocation that in cases in which the retention after the bloodless reduction is difficult or the reduction impossible, a hypoplasia of the acetabulum is the underlying cause. Deutschlander has recently shown and proved by experiments on animals that in most of the cases of congenital dislocation we do not find a hypoplasia of the acetabulum, but a hyperplasia of cancellous and fibrous tissue within the acetabulum. This cancellous tissue, which can not be demonstrated by Roentgen rays, is one of the causes of difficulties in reduction by the Lorenz method and for retention of the head of the femur after the reduction has been accomplished. Dr. Thienhaus did not agree that the bloody operation will be the operation of the future. All those who are now the ardent advocators of the bloodless method, as Lorenz, Hoffa, Mickulicz, Lexer and others, tried the bloody methods of reduction first, but after a large experience taught them that by using this method we are very liable to have stiff joints as a result, and after they were convinced that the results obtained by the bloodless reductions were far superior to those obtained by the bloody methods, they accepted it as a law in all cases first to try the bloodless method of reduction, and after two or three attempts by this method have proved unsuccessful or the functional results obtained unsatisfactory, then to use the bloody method. If cases are taken at a suitable time, that is, from the third to the fifth year, surgery can show from 60 to 80 per cent. good functional results.

DR. HARRY M. SHERMAN, San Francisco, said that it certainly is a novelty to say that a congenital dislocation can be reduced by a gentle manipulation repeated a number of times, when it can not be reduced by violent manipulation at one sitting. Dr. Sherman said that it was as difficult for him to understand how Dr. Willis puts the femoral head through the narrow part of the capsule as it was difficult for him to understand how anyone can do it by violent manipulation after the method of Lorenz, excepting in a very small percentage of cases. The proposition is the old difficulty of making the femoral head pass the opening in the neck of the capsule. The former is invariably larger than the latter. The opening is smaller than is the bone which has to go through it. About the highest percentage of satisfactory anatomic repositions which can be expected is 10 per cent. with the forcible manipulation of Lorenz. Dr. Sherman still believes that the method which is right is the one which definitely does what the operator sets out to do. Dealing with a dislocation, the object is to reduce it. He said he could not accept any method as satisfactory which fails to reduce, and he did not see any reason for temporizing with a half-way measure when a real anatomic reduction can be accomplished by means of a small incision, an incision which shall go anterior to the tensor vaginæ femoris so as to avoid cutting off its nerve supply, and which shall cut no muscular tissue, and lying in its original position. In the latter case they may capsule of the joint. Through this the head can be put into the acetabulum and the reduction will have been accomplished. Dr. Sherman wanted to hear Dr. Willis' explanation of how

he accomplishes the feat of making the camel go through the eye of the needle.

DR. E. H. PARKER, Portland, Ore., said that he has under his care a family in which the grandmother, aged 60, weighing 200 pounds, has congenital dislocation of the left hip joint, which has given no trouble all these years, although she has raised a large family. She walks with a limp, but gets along nicely. Her oldest daughter has congenital dislocation on the same side, but her granddaughter, a child of 10 years, is perfectly formed.

DR. JAMES E. MOORE, Minneapolis, protested against the misnomer, "the bloodless operation." He declared it the most bloody and the most unsurgical procedure that he had ever had anything to do with. The operation of the future will be the open operation and not a mutilating one, which does not give the surgeon the opportunity to see what he is doing. There will be no more stiff legs and deformed children. The Lorenz method leaves the patients in worse condition than they were before.

DR. S. C. BALDWIN, Salt Lake City, said that he believes that Dr. Sherman is very near to the proper solution of the problem. There is in all these cases a malformation of the head and a filling up of the acetabulum. The head is so badly shaped that it will not stay in position. Dr. Baldwin said that the Lorenz operation is a very bloody operation, and that he does not believe that we should resort to it to such an extent as to cause a severe ecchymosis. The Hoffa operation does too much damage to the soft tissues. The operation of the future will be done in the general way Dr. Willis speaks of. After cutting down with a small incision, the head of the bone will be put in position. With all precautions there will at times be suppuration. It is not possible to avoid this in every case, and consequently an operation by the manipulation method without any great damage to the soft tissues is the best thing to do. Dr. Baldwin believes that the coming operation will be the Sherman operation.

DR. A. J. OCHSNER, Chicago, expressed the fear lest the drift of this discussion, being entirely against the manipulative method, should leave the wrong impression on the minds of those who have no experience with this operation. A great amount of harm has been done in patients not properly selected, especially as regards the age of the children, but this is not the case where the proper selection is made. Dr. Ochsner said that he could speak with authority because he has seen some twenty cases properly selected in which the dislocation was proved by the skiagraph before the treatment was begun and, after the treatment was completed, the skiagram showed that the dislocation had been reduced. Moreover, in one case of a double dislocation of which there is a skiagram, he has seen the specimen after autopsy, the patient having died three years later, after walking perfectly for one and a half years. The skiagram showed absolutely that there was a dislocation before this treatment was commenced, and as shown by the specimen, it was absolutely reduced; consequently this shows what can be done in properly selected cases. Dr. Ochsner said that he had never operated by the manipulative method. All of the cases he has observed before and after the treatment were operated on by his brother. In young children, to the age of 5 or 6 years, this method should be employed by a competent surgeon. If a surgeon knows how to perform this operation properly and chooses the proper kind of cases, this method will produce many excellent results which will be functionally and anatomically satisfactory.

DR. P. W. WILLIS replied as to the position of one of the hips shown, of which it was said that this, being anterior to the plane of the body, would tend to cause a posterior dislocation. This hip was reported as being anterior and was brought forward purposely in order to bring the head of the bone back nearer the acetabulum. Some say that the open incision is a surgical procedure. After reading reports and hearing Dr. Willard's remarks, Dr. Willis still considers that this intensely surgical procedure gives us stiff joints and crippled patients. It does not matter whether the procedure is surgical or otherwise, providing the desired result is obtained. One speaker says: "Make a very little opening; what harm can it do?" Enough germs can get into a small opening to ruin both hips. A penetrating wound is one of the most dangerous. If an incision is decided on, make a large one to place the head in position. It is not everything, however, simply to open the joint. The long muscles are shortened, and it is necessary to stretch these and other structures in order to put the head into place. The reduction of the head is often easy, but to keep it there is the point. Even with open incision Dr. Willis' cases do not always stay there. According to the pathology of this condition, at birth the head of the bone is very close to the acetabular cavity, and in the majority of cases there is a large short capsule without contraction. As the child begins to walk, however, the head of the bone passes away from the socket and in time the capsule may be drawn out until it presents that contracted condition shown by Dr. Sherman. When this takes place the open operation is indicated. Good functional results are what we are striving for, and in many instances these can be obtained by the manipulative method. Dr. Willis disclaimed responsibility for the term "bloodless;" he did not refer to it in his paper. The operation is not bloodless, and even with great care there is ecchymosis. The manipulation should be as gentle as possible.

THE CURE OF HERNIA.*

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BOSTON.

Three decades have nearly passed since I first obtained respectful attention from the Section on Surgery of the American Medical Association, when I announced a new method for the cure of hernia.

This method was based on the reconstruction of the inguinal canal to its normal obliquity. This was rendered possible only by a free dissection of the parts, the resection of the redundant peritoneum and closure of the deeper structures beneath the cord. The cord was then replaced and the external structures united. The wound was sealed with collodion. The suture material was catgut, furnished me from Glasgow, Scotland, by the instrument maker who prepared ligatures for Mr. Lister, after his formula. The buried animal suture was the inspiration of the moment, born of necessity, in the closure of a strangulated inguinal hernia. This was in 1870. A long series of histologic experimental studies on animals was undertaken to determine the results of buried suturing, and the technic of the operation was carefully worked out in detail.

The crucial experience of the years has naturally resulted in very many modifications of technic, by many surgeons. The fundamental factors of the operation, however, must ever remain the same, since they are based on the physiologic plan of normal development.

The obliquity of the inguinal canal was more or less recognized by all the early anatomists, but, so far as I am aware, had never been emphasized, or even referred to, as the reason why hernia did not take place in the normally developed male. The reason that hernia is not more common is dependent on the fact that the intra-abdominal pressure, acting on the normal structures, brings this force to bear at right angles to the long axis of the canal and hence, the greater the pressure, the more closely the walls of the canal are approximated.

This valve-like construction of the canal is brought into play in the human organism only in two other instances: the entrance of the hepatic and pancreatic ducts into the intestine, and the point of entrance of the ureters into the bladder.

* Read in the Section on Surgery and Anatomy of the American Medical Association, at the Fifty-sixth Annual Session, July, 1905.

The operative procedures for the cure of hernia are absolutely dependent on the use of buried sutures, since without them the reconstruction of the inguinal canal to its normal pattern is impossible.

More or less imperfect attempts were made to accomplish this, without recognition of the principle, by many of the early operators. One was the so-called invagination process, in which an instrument was firmly thrust, from below upward, through the canal, returning the peritoneal pouch, thereby carrying the cord upward, and fixing it in position by the introduction of wire sutures from below; more commonly they were brought out externally and twisted over some foreign material to protect the skin. Infection usually followed, and suppuration was welcomed because of the belief that the infiltration and induration, which supervened, greatly aided in strengthening the surrounding parts.

This method was improved on by the distinguished surgeon, John Wood of London, and his still well-known method of suturing by the implantation of wire, without the plug, in the canal. He became very dexterous in this operation and reported a large number of cures. Without especially emphasizing the reason, the result attained was the lifting of the internal ring and the cord to a much higher plane in the abdominal wall.

At an earlier period, great success was attained, especially by the surgeons of France, in the cure of hernia by boldly making an open wound, excising the testicle and cord and either closing it by means of sutures or, perhaps more commonly, by treating it as an open wound and allowing it to granulate from the bottom. This latter method was emphasized, since it was believed that the cicatricial mass resulting gave a stronger abdominal wall. It is extremely probable that these observations were correct, since the open-wound method and through and through suturing gave a wound almost necessarily septic, with a very imperfect result. Even now it does not appear possible that improvement could have been made on the older measures, until the scientific demonstration of wound infections, and, as a consequence, how to avoid them became the basis of a new technic. This must ever remain to the immortal honor of my great master, Lord Lister.

The object of this paper, however, is not a historical résumé, but rather to ascertain if, even now, we have arrived at a general consensus of opinion as to the measures which are essential and the operative procedures which should be adopted. At the outset let it be emphasized that, while the general measures of restoration may be agreed on, it is a well-known principle of applied mechanics that the operator best attains results by the means with which he is most familiar. While there are comparative means of excellence and the result attained good, the methods employed should never be considered absolutely faulty unless they fail to accomplish the end desired.

To make myself more clear, the first object of eating rice is the transposition of this nutritious article safely into the stomach. The Chinaman would declare that his chopsticks were used far more advantageously for this purpose, and besides that nine-tenths of all the rice eaten is expeditiously carried into the mouth by these simple instruments. Few Europeans or Americans, for this reason, however, would be content to abandon the fork or the spoon. For an equally good reason I should consider relatively immaterial the character of needle or other instruments employed. This view relegates as comparatively unimportant a very considerable number of so-called methods which are prominently labeled by the name of the author.

Beside the anatomic reconstruction, the one essential is the absorbable, animal suture. This may consist of properly prepared catgut, but for many reasons the carefully selected tendons from the smaller varieties of the kangaroo are much to be preferred. When prepared to retain their strength for only a few days—and they permit of ready absorption—they are ideal. They must be applied, however, so as to hold the reconstructed structures in coaptation with as little injury as possible and without constriction of the enclosed parts. Too much force applied is an almost universal criticism.

CAUSE.

When we remember the late period of development in fetal life, and that by second thought, as it were, Nature changed her plan and decided to remove the testicles from within the abdomen; and when we study the method by which she accomplishes this object, we not alone find the reason why such a large percentage of males suffer from hernia, but may wonder, rather, that more are not subject to this infirmity. The spermatic cord for the transfer of semen from the testicle to the seminal vesicle is not alone enormously lengthened, but its double system of accompanying vessels must be maintained. Organs of considerable size must be transposed to an entirely new relationship and they must carry before them a prolongation of the peritoneum as a proper protecting envelope. This dainty enwrapping structure becomes blended with the vas deferens and vessels, making up the component parts of the cord. This structure must lie at easy physiologic anchorage and yet the abdominal wall must not be weakened by its passage.

Defective closure of the internal ring is not rarely apparent, even in men who are not afflicted with hernia. Cloquet came to the conclusion, after 500 dissections, that the internal ring was so open that a depressed spot in the peritoneum marked its site, and this has since been called after him, the infundibular process of the peritoneum. In the normal subject, however, this is produced only by pulling on the cord, when, of course, its attachment will deflect outward the abdominal peritoneum. My own studies lead me to believe that the internal ring is often unduly open, owing to an incomplete development, and that this is by far the more common cause of hernia, even in those patients in whom this infirmity develops late in life.

By a singular, wise provision of Nature, the intestinal contents are so distributed that the law of gravity is minimized in its hydrostatic pressure. This, however, is necessarily greater in man, as an upright animal, on the lower portion of the abdominal restraining wall, than in the quadruped, and man, therefore, is much more likely to have hernia of the inguinal canal than animals.

Given a slight weakening of the internal ring in man, producing a dimpled depression, and multiply the intra-abdominal force constantly called into play by the time element of years, and we can easily see that there may come a period when these structures, little by little, may yield and form an opening for the lodgement, or escape, of a portion of the abdominal contents.

The man may not have been seriously incommoded until a late period of life. At last a sudden yielding of the external barrier gives evidence to him of the disability, which on this account has from time immemorial been called rupture.

The imperfect completion of the normal process following the extrusion of the testicle is often noticed in early childhood, when a decidedly open canal may be demonstrated, but Nature usually safely finishes the process during the early years of development; this is similarly noticed in umbilical hernia.

WHEN SHALL WE OPERATE?

The preceding discussion leads us to the proper consideration of the class of cases in which operation should be advised. During the tentative period of operative study, naturally all surgeons were more conservative. Since it has been shown that the operation is practically without risk to life, there has been a steadily increasing opinion favorable to operation. Contrary to the views of even a few years ago, at the risk of being dogmatic since the limits of the paper do not permit discussion, we may safely determine that the operation is advised on all children in whom there is difficulty in retaining the abdominal contents.

In children, my personal experience has been large and it has proved a profitable field of study in the elucidation of the fundamental causes of hernia.

Since the methods already referred to and which are to be more specifically described a little later have their simplest application in childhood, they are here to be especially commended. It is true that the surgical manipulation is as dainty as that on the eye, and, as a consequence, is as esthetically admired, but the collodion seal, as a sure antiseptic application, robs the subsequent treatment of its chief difficulty and danger. Were there not a more serious side to the consideration of the more commonly applied antiseptic dressings, by which the little patient is made an intense sufferer, this legacy of conservatism of the past would assume a most grotesque aspect. Some time since I saw one of these little martyrs of so-called modern science enveloped with swaddling clothes like a mummy, held in place by a plaster of Paris, fixed bandage, enveloping the little sufferer from the knees to the navel, and this in a children's hospital holding a first place in the greatest city of America.

A recent English writer tabulates several hundred operations on children, and ascribes a large share of his success to that which I unhesitatingly call a most cruel and injurious procedure.

All know that repair processes in young animals go on much more rapidly than elsewhere. The straining from crying is perhaps the greatest danger with which we have to contend. The happy child cries least, or not at all; and how can we hope to avoid these expressions of pain induced by such inquisitional surgery? The young adult, otherwise healthy, demands relief at our hands from a lifelong infirmity—an infirmity which debars him from athletics, from Government service, and from many of the more active and lucrative departments of life's vocations.

In all the older periods of life the hernial contents may not be safely and easily retained by external supports; in all the more grave and disabling conditions, where life's vocations are seriously limited, and pain and disability are present. There is a small class of cases in which the transposition of the abdominal contents is so extensive as not to permit a safe return into the contracted abdominal cavity, but this class is an extremely limited one and even there measures may be devised, preceding surgery, to make the operation usually a safe one.

OPERATIVE PROCEDURES.

In discussing the essentials, these should be reduced to the last analysis. Asepsis must be maintained, the contents of the hernial sac examined and reduced. The sac itself, if in any considerable degree pathologic and enlarged, is dissected to its base, evenly sutured, under slight tension, in the line of the axis of the canal and resected. The resilience of the peritoneum is quite sufficient to cause it to present an intra-abdominal smooth surface.

The suture best adapted for this purpose is a fine, double, continuous one, care being taken to coapt and not to constrict the included portions. The problem of restoration of the posterior wall of the canal is not so simple, owing in large measure to the deformed and weakened conditions found. Sir Astly Cooper, so far as I know, was the first to point out the singular increase of strength and reinforcement by Nature of the tendinous expansion of the transversalis muscle. Incorporated fibers of the muscle itself are sometimes seen to extend above the internal ring. When this condition exists the internal ring may be said to consist of a slightly ovate opening in the transverse muscle. One certainly finds Nature's strongest bulwark of the posterior wall of the canal to consist of these structures.

In a hernia that is at all pronounced, however, these are so weakened and deformed that they do not furnish a secure reinforcement for the reconstructed internal ring and posterior wall of the canal. In order to give additional strength, I have usually found it wise to include the posterior fibers of the conjoined tendon which are coapted with the posterior fibers of Poupart's ligament. In almost every instance in this way a safe, secure, firm posterior wall of the canal and internal ring, reformed high up on the cord posteriorly, may be constructed. It leaves, as lateral walls, the outer edge of the conjoined tendon and Poupart's ligament.

In other words, this portion of the canal, so far, has been restored in its normal relations and length. It now remains to replace the cord and to restore the divided fibers of the external oblique to reform the external wall of the canal. It may be well, at least for one of comparatively limited experience, to mark by forceps or suture the long, brilliant fibers of the external oblique at the time of division, and then there is an anatomic landmark for their reconstruction. I am in the habit of taking an extra suture through the structures which go to make up the upper border of the internal ring, since I have known a few cases of direct hernia to follow when the structures were unduly weak. This may not be necessary, but I deem it a wise precaution; a single mattress suture is usually the best means of reinforcement.

A third suture, subcuticular, also continuous and of the very finest type of material is taken through the deeper layer of the skin only; care should be observed that the needle does not penetrate the hair follicles or sweat ducts. If applied with proper care and accuracy, the edges of the skin are held in even coaptation. The collodion seal, reinforced by a few fibers of cotton, carefully applied and dried, finishes both the operation and the dressing.

If accurately and aseptically applied, easy, painless primary union will supervene.

Following these processes of repair, a strong, reconstructed inguinal canal is formed of normal obliquity. The intra-abdominal pressure is evenly borne by the reconstructed abdominal wall and hernia is no more

likely to return than in the individual in whom the processes of normal development took place.

If the limits of this paper permitted, we would find a most interesting chapter of history in tracing the various modifications of this operation which have been recommended, especially during the last ten years.

Underlying these is a more or less intelligent effort at reconstruction to the normal pattern. The structures involved have been variably manipulated, even to the transplanting of the cord outside of the external oblique muscle. This latter method is, of course, not to be commended, since the structures of the cord are comparatively unprotected in their new relations and, at the best, emerge through a direct opening in the abdominal wall.

To all surgeons familiar with the practical advantages of the absorbable suture, it seems strange that any good operator can still be found using silk as a buried suture. Recently I discharged from the hospital a young, otherwise healthy, man who last December was operated on by one of Boston's chief hospital surgeons for the cure of hernia. By accident the cord was divided and, as a consequence, the testicle was removed. The hernia was cured, but he had had four subsequent operations because of stitch abscess. It became necessary to make a free dissection in order to find and to remove two deep silk ligatures, one of which was still encompassing the cord. The wound was reclosed by buried tendon sutures and the operation was followed by primary union. Instances of this sort are far too common to be considered accidental or ascribed to fault of technic other than the use of improper suture material.

Dr. Maynard of Dedham, Mass., in 1846 gave to the profession, as a surgical dressing, collodion, a discovery made incidentally to his research work in the investigation of gun cotton. The discovery has proved to be of very much greater value than was at first supposed, since its use in septic wounds, then almost invariably the rule, was detrimental rather than otherwise. An aseptic wound aseptically closed by aseptic, buried, absorbable sutures, is kept aseptic by the use of the collodion seal. Iodoform, in solution, inhibits the development of the *Streptococcus pyogenes albus* in the skin. The seal is loosened only by the proliferation of the epidermal cells and is absolutely trustworthy for a week or ten days. Such a seal may be reapplied, but an aseptic wound thus aseptically treated has in this period undergone processes of repair and is beyond the danger of subsequent infection.

The measures here recommended apply equally well to all aseptic wounds in all parts of the body, but they were first used and their values demonstrated in my early operative work for the cure of hernia.

Special Article

IMMUNITY.

CHAPTER XXIII.

PARATYPHOID FEVER.

In 1900 Schottmüller cultivated from the blood of five "typhoid" patients organisms which differ from the typhoid bacillus in that they attack dextrose with gas formation and are not agglutinated conspicuously by antityphoid serum. Since that time many similar cases have been reported and two types of the paratyphoid bacillus have been recognized (Schottmüller). Group B causes first an acid reaction in milk which changes to a permanently alkaline reaction in about ten days, whereas Group A causes permanent acidity. (Kayser.) They resemble the typhoid bacillus morphologically. These organisms are more closely related to the bacillus enteritidis than to the typhoid bacillus.

Two Types of Organism.

The term paratyphoid is justified only because of the similarity of the symptoms to those of typhoid fever.

Previous to the observations of Schottmüller, Widal, in 1897, had shown a "paracolon" bacillus to be the cause of a typhoid-like infection, and a similar observation was made by Gwyn in this country in 1898. These organisms are not different from those which are now called paratyphoid bacilli, and the infections resemble the recorded cases of paratyphoid fever. The term "paracolon" should no longer be applied to these organisms.

"Paracolon" Bacilli.

The disease occurs sporadically or in epidemic form, and bears a close resemblance to mild typhoid-like epidemics which have been noted from time to time, and which, presumably, were caused by eating poisonous meats. One such epidemic of 600 cases was caused in Switzerland in 1878 by the meat of a sick calf; the mortality was 1 per cent. A still older epidemic (1839) is cited, likewise caused by meat. In both instances, the infection eventually was carried from person to person by contact. A recent epidemic in Kiel, proved to be paratyphoid, is assumed by Fischer to have been caused by infected meat, on account of the peculiar distribution of the cases among the patrons of a particular market. Kurth also attributed a small epidemic to either uncooked meat or milk. Fischer mentions an epidemic of 50 cases in East Holstein which probably was caused by the milk of two infected cows. Shortly after the epidemic began the cows died and paratyphoid bacilli were cultivated from the muscles, spleen, liver and intestines. Infected water also may cause epidemics. De Feyfer in an epidemic of 14 persons in Holland, considered that the disease was transmitted through the water of a stream in which the clothing of the first patients had been washed. In another instance, a regimental infection (Saarbrücken) was traced to the discharges of a single soldier, the water supply having become contaminated through a defective water closet.

Methods of Infection.

Paratyphoid, like typhoid fever, is accompanied by an enlarged spleen and many rose spots. Although severe symptoms may be present for a time the course of the disease usually is mild and the mortality is low. The incubation period approximates that of typhoid. In the few cases which have come to autopsy the intestinal lesions have varied from a mild ileocolitis with an intact mucous surface to a condition of superficial ulceration. The involvement of Peyer's patches and the solitary follicles which is so characteristic of typhoid is absent, although these structures may be moderately swollen. The mesenteric lymph glands are not markedly involved and there is little proliferation of the lymphoid or endothelial cells (Wells and Scott). The disease has no specific anatomic lesion.

Characteristics of the Disease.

The organisms are found in the blood and various organs, in the rose spots, urine and feces of the patients. Practically nothing is known of the occurrence of the bacilli outside the body. Because of their presence in the stools and urine of the patients, the methods of dissemination and infection doubtless are similar to those concerned in typhoid. The bacillus is said to have a marked resistance to heat, withstanding 60 degrees C. for 30 minutes and not all cells being killed during one hour at this temperature. This may explain the fact that the virus is not always killed by cooking the meat. The organism probably has a wide distribution because of the occurrence of the infection in various parts of the world.

Occurrence of Bacillus in the Body.

The toxicity of the bacilli depends on the existence of a fixed endotoxin; a soluble toxin is not produced.

The principles of prophylaxis against typhoid also apply to paratyphoid fever, with the addition that in the latter disease the possibility of meat infection must be kept in mind.

The serums of patients and immunized animals acquire bactericidal and agglutinating powers for the organism.

There is no serum therapy for the infection, nor has the occasion arisen to attempt vaccination.

Agglutination and Blood Cultures.

Serum from a paratyphoid patient may agglutinate the homologous bacillus in a dilution of 1/1000 or 1/2000 or more (E. H. Ruediger), whereas the typhoid bacillus is agglutinated only in low dilutions by the same serum. However, bacillus A and bacillus B are not identical in their agglutinable properties; in this respect it is stated that the latter is more closely related to the typhoid bacillus than the former. The agglutination test is said to have a higher diagnostic value than the Gruber-Widal reaction in typhoid, a stronger agglutinating power being developed in the serum of the patient. Nevertheless, the formation of coagglutinins may render the test confusing if proper serum dilution is not practiced. Conclusions should not be attempted until the test has been performed with both strains of the paratyphoid bacillus and with the typhoid bacillus. As in typhoid, early diagnosis may be best accomplished by bacteriologic examination of the blood.

DYSENTERY (BACILLARY).

Amebic Dysentery.

In 1878, Lösch, in St. Petersburg, discovered in the stools of dysenteric patients a protozoon ameboid organism which is now recognized as the cause of amebic dysentery. The organism is called Amœba coli (Lösch) or Amœba dysenteriæ (Councilman and Lafleur). The disease prevails especially in tropical and subtropical climates, but also occurs in sporadic form or in small epidemics in temperate latitudes, and often becomes chronic.

Bacillary Dysentery.

There is another type of dysentery, an acute infection which often appears in widespread epidemic form in both tropical and temperate climates, and prevails especially in the summer months. Such epidemics occur extensively in Japan, where the mortality may be 24 per cent.; in the Philippines, United States, Germany and other European countries. In industrial settlements in Germany the mortality is about 10 per cent. (Kruse). The incubation period may be as short as two or three days. In mild cases the patient may recover in from four to eight days, whereas severe cases last from two to four weeks, during which time death may occur. Occasionally the infection lasts sufficiently long to be considered chronic.

Two Types of Bacilli.

In 1898, Shiga, basing his conclusions on positive results with the agglutination test and on the constant presence of the organism in the stools of the infected, identified as the cause of the disease in Japan a microbe which is known as Bacillus dysenteriæ (Shiga). Flexner, in 1900, made similar observations on epidemic dysentery in Manila, and his organisms or one of them, differing slightly from that of Shiga is called Bacillus dysenteriæ (Flexner), or the Flexner-Harris bacillus, Harris being the name of the patient from whom this typical strain was cultivated. Kruse (1901) found both the Shiga and Flexner types in Germany, needlessly giving the names of "pseudodysentery" bacilli to the latter. In this country similar organisms have been found as the cause of institutional dysentery by Vedder and Duval, of summer diarrheas of infants by Duval and Bassett, and by Wolstein. It is the belief of Vedder and Duval that acute dysentery, the world over, "whether sporadic, institutional or epidemic, is caused by the dysentery bacillus." We must note, however, that the organism is not found in all cases of clinical dysentery, even by skilled bacteriologists. "Clinically, 24 of our 97 cases in which dysentery bacilli were found did not differ from the cases of ileocolitis in which the dysentery bacilli were not found." (Weaver and others.) It seems certain, nevertheless, that Bacillus dysenteriæ is the most important cause of acute dysentery. It rarely occurs in the stools of healthy individuals.

Summer Diarrheas.

The organism has about the dimensions of the typhoid bacillus, but is thicker. It probably is non-motile, although Vedder and Duval, in opposition to others (Lentz) claim to have demonstrated flagellæ. It often shows a polymorphous appearance in cultures, but forms no spores. It is Gram-negative. It lives for from 12 to 17 days when dried (Pfuhl); direct sunlight kills it in 30 minutes, 1 per cent. carbolic acid in 30 minutes, 5 per cent. carbolic acid plus corrosive sublimate (1/20000) almost instantaneously. It is thought that it may live over winter and cause fresh outbreaks in the spring (Kruse).

Characteristics of the Bacilli.

The organisms of Shiga and Flexner differ in their actions on sugars (i. e., in their acid-forming powers) and in the agglutinability. "The 'Shiga' type attacks glucose, but none of the other sugars, including mannite and lactose. The 'Flexner' type attacks glucose and mannite and dextrin but not lactose." (Flexner.) The "Flexner type then is the stronger acid-forming. An artificially produced immune serum which is specific for one organism has rather higher agglutinating and bactericidal powers for the corresponding type, but low for the other. Several other organisms have been cultivated from dysenteric patients, but their variations from these two types are slight. All are certainly very closely related. In this country the "Flexner" bacillus is much more common than that of "Shiga," but here and abroad both types are met, and sometimes in the same individual.

Distribution in the Body.

In the living, the bacillus is found only in the stools of the infected, in the mucous or muco-hemorrhagic portions of which it exists almost in pure culture, few colon bacilli being in the immediate vicinity; it has not been found in the blood or urine. In fatal cases, Shiga found it only in the intestinal ulcers and swollen lymphoid structures and in the mesenteric lymph glands. Flexner mentions its occurrence in the liver. The organism, if it reaches the circulation at all, either does so in small quantities, or is rapidly destroyed by the blood. The infection resembles cholera, but differs from typhoid and paratyphoid in this respect. An observation by Markwald (cited by Lentz) indicates, however, that the bacilli may reach the circulation. A woman sick with dysentery gave birth to a child, which died within a few hours. Dysenteric changes were found in the intestines, and the bacillus of dysentery was cultivated from the diphtheritic deposits on the intestines, from the meconium and from the heart's blood. The organisms must have reached the child through the placenta from the circulation of the mother.

Lesions.

The intestinal lesions vary from a simple inflammatory hyperemia to rather extensive superficial necrosis (diphtheritic inflammation), which rarely extends below the submucosa. Such foci are said to be the most marked in the descending colon and sigmoid where mechanical injury is most likely to occur. The necrotic areas separate by sloughing, leaving superficial ulcers. The lymphoid follicles are swollen and infiltrated with polymorphonuclear leucocytes, which also accumulate in the dilated lymph spaces of the intestinal wall. The ileum is so commonly involved that the condition is called an ileocolitis. Conspicuous changes are not found in the mesenteric glands or spleen. The liver and kidneys commonly show parenchymatous degenerations.

Toxicity of Organisms.

The dysentery bacillus is a highly toxic organism. Subcutaneous injections of killed cultures in man produce a more profound reaction than the organism of either cholera or typhoid. Ordinary laboratory animals are so susceptible that they are immunized with difficulty; the horse is less susceptible. The toxicity of the organism apparently depends on an intracellular toxin (an endotoxin) rather than on a soluble toxin. When living or killed cultures are submitted to autodigestion in salt solution (Conradi, Nisser and Shiga), or when bouillon cultures are allowed to grow for 30 days, the liquids are found to be toxic after the organisms are removed. In both instances, this toxicity probably depends on the liberation of endotoxins. The question as to whether the bacillus in the intestines produces a soluble toxin which is absorbed by the lymphatics, is undetermined. It seems more probable that the conditions

are analogous to those of cholera, intoxication resulting from the liberation of endotoxins by the solvent action of the tissue fluids or cells on the bacilli. Dysenteric symptoms are not produced in animals by feeding the organisms.

The stools of the patient are the only known source of the organism and it continues to be excreted during convalescence.

Dissemination and Infection. Latent or chronic cases are a source of danger to a community. Although the conditions outside the body are not favorable for the growth of the organism, it may remain living and virulent for several months. The methods of infection appear identical with those seen in typhoid. Water infection seems certain, and indirect transmission is readily accomplished by contact with the discharges. The best examples of contact infection are found in institutions, as insane asylums, or foundlings' homes, where the disease may become endemic.

Prophylaxis and Susceptibility. The first essential for prophylaxis is correct diagnosis, for which the agglutination tests and bacteriologic examination of the stools are essential. Disinfection and other precautions should be practiced as rigidly as in typhoid. The patient should not be discharged until the stools are free from dysentery bacilli.

Poorly nourished individuals are particularly susceptible to infection, and among them the mortality is high. The disease is most common among young children, old people, and those who are confined in institutions. The conditions in Japan, however, where from June to December of one year nearly 90,000 were attacked, and in Germany, where severe epidemics occur in industrial communities, indicate that susceptibility is quite general. Digestive disturbances and enteritis from other causes are said to be predisposing factors. The normal serums of man and animals have very little bactericidal power for dysentery bacilli.

Immunity. The subject of acquired immunity to dysentery is hardly on a satisfactory basis. The serum of convalescents shows a distinct bactericidal power for the organism, and there is good reason to believe that the acquired immunity persists for some time after the disappearance of the bactericidal amboceptors, an event which takes place rather early. As in typhoid, animals which through immunization have once been stimulated to produce antibodies, form them much more readily on the occasion of a subsequent inoculation. This acquired facility of producing antibodies may be a factor in acquired immunity. By immunizing horses, serums of rather high protective power have been obtained. Kruse prepared a serum of which 1/80000 gram would save a guinea-pig from a dose of the bacilli which killed a control in 20 hours. It is assumed that the protective power of this serum is due to its bactericidal action. The antitoxic serum which Rosenthal prepared, by immunizing with 30 days' old bouillon cultures, protected not only against the toxin, but also against the bacilli; and conversely an antibacterial serum protected against the toxin (cited by Lentz). Such results leave us very much in doubt as to the existence of a true antitoxic serum.

Vaccination and Serum Therapy. The value and feasibility of protective inoculations are not well established. Shiga at one time practiced mixed active and passive immunization (bacilli plus immune serum) on 10,000 individuals. This did not decrease the number of infections, although a lower mortality resulted. Shiga claims that the therapeutic use of his serum reduces the mortality to one-third of the untreated. The serum of Kruse, and also that of Rosenthal, are said to be curative; the discharges rapidly decrease in number and the course of the disease is shortened. In the hands of the Rockefeller Institute antidysentery serum proved of no distinct value.

Agglutination. The agglutination reaction with the serum of patients shows great variability. It is sometimes absent in spite of the presence of bacilli in the stools, and often disappears rapidly during convalescence (in two weeks occasionally). It is rarely as high as in typhoid, and this is true also of artificially prepared serums. In infantile diarrrheas it commonly appears at about the end of the first week of illness (Duval and Bassett). Evidently mild cases in which the course of the disease is from four to eight days may not be recognized by means of the agglutination reaction before the period of convalescence. In chronic cases it may persist from three to four months. In a series of cases studied by Duval and Bassett, the reaction with the serums of the patients was obtained in dilutions varying from 1/16 to 1/25, twenty times; 1/40 to 1/60, twelve times; 1/100, twice; 1/200, three times 1/500, once; 1/1000 twice. No reaction was obtained with the typhoid bacillus. Kruse considers the reaction diagnostic when it occurs in a dilution of 1/50; Pfuhl, 1/30. Strong co-agglutinins for other organisms, i. e., above 1/50,, have not been observed (Lentz). The tests should always be performed with both the "Shiga" and "Flexner" types, as the two have not identical agglutinable properties, and either organism may be the cause in a given instance. The absence of the reaction does not exclude dysenteric infection positively. Bacteriologic examination of the stools is important, often necessary, for early diagnosis.

Clinical Report

A CASE OF AINHUM.

MARCUS F. WHEATLAND, M.D.

NEWPORT, R. I.

Seeing the article on ainhum by Dr. Brayton in THE JOURNAL, July 8, 1905, reminded me of a similar case which came under my care about six years ago and which was reported to the Newport Medical Society during the past year.

Previous and Family History.—M. R., negro, widow, aged 53, was born in Queen Anne County, Maryland. Her mother died in childbirth, aged 42; her father was part Indian, and died of rheumatism, aged 92; he lost both toes when about 23 years old.

The patient consulted me in December, 1899, at which time a band had formed around the base of the little toe of the left foot, and from a fissure formed at this point there came a discharge. The toe was swollen and painful. With cleanliness it improved and remained quiescent until 1903, when it again began to swell and to cause great pain. The patient stated that one evening while in great pain the toe parted from the foot as if shot from a pistol and landed about 8 feet across the room carrying with it a piece of cloth which was wrapped around it. The disease appeared in the right foot about two years previous to its appearance in the left, but the process in the former was never very active. She thinks the process in the left foot was completed in four years.

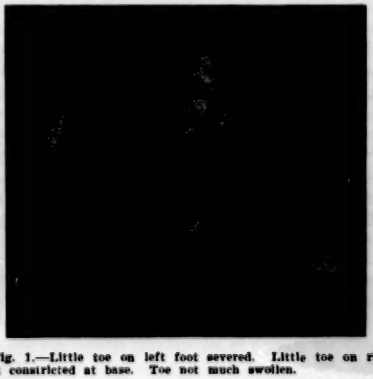

Fig. 1.—Little toe on left foot severed. Little toe on right foot constricted at base. Toe not much swollen.

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RECENT ADVANCES IN PHYSIOLOGIC CHEMISTRY.

In his recent address before the American Chemical Society at its Buffalo meeting, Professor J. H. Long[1] discusses briefly some of the most important recent advances in physiologic chemistry. While the work referred to may be familiar to many, nevertheless an outline of Professor Long's address may not be without interest because it should give us a fairly definite idea of what the actual workers in this field, the physiologic chemists, themselves consider the most important lines of advance.

The first problem discussed is that of protein in nutrition, a much debated question ever since the beginning of physiologic chemistry. Liebig held that the protein substances were built up into tissues and that the oxidation of these was the sole source of muscular energy. In 1866, however, Fick and Wislicenus showed that protein combustion was far too little to account for the muscular work done in an ascent of Faulhorn, and since then practically all who have investigated the subject have concluded that fats and carbohydrates are the usual sources of muscular energy in man. The Liebig theory implied that our protein consumption should be high, but in time the wisdom of this plan came to be doubted. If protein is of use mainly to repair waste in the tissues, why expend large amounts of extra energy on the useless metabolization of more protein many times over than necessary? Thus arose the question how much protein is really necessary for the normal body? The most conclusive answer to this question has been given recently by Professor Chittenden of Yale University, based on experiments on himself and on groups of men engaged in different occupations, the results of which are published in book form under the title of "Physiological Economy of Nutrition." These results show, as is no doubt well known to most of our readers, that the usual protein intake may be restricted greatly for persons in all ordinary occupations (professional men, soldiers, athletes), and with evident benefit so far as the general physical condition is concerned. Consequently, the Chittenden investigation marks a decided step forward in the adjustment of our diet to our physiologic needs—a most important advance in physiologic chemistry, and of direct interest to physicians.[2]

1. Science, Aug. 4, 1905.

2. This matter was discussed very thoroughly by Dr. Billings and others in the Section on Practice of Medicine at the Portland Session of the Association.

The next phase discussed by Long deals with the structure and composition of the protein molecule. This problem is even older than the previous one, and up till about five years ago the work on it was largely by way of destructive analysis, and it became established that the products of protein destruction are essentially the same so long as it is done in water. The question now arose, is it possible to build up a true protein molecule with these substances, and the answers so far obtained are connected with the two names especially, Curtius and Fischer. Curtius has produced a large number of amino groups and Fischer has synthetized a large number of substances called by him polypeptids, many of which are hydrolyzed by pancreatic juice, give the biuret reaction, etc. In this way it is expected that bodies of great physiologic interest may be constructed.

The study of the soluble ferments is another field of physiologic chemistry in which great advances are being made. A few years ago the question of digestive enzymes was looked on as settled, but the recent investigations of Pawlow has upset entirely the established conceptions of their action. Pawlow has shown that the same digestive ferments have peptic and milk-curdling powers and discovered, furthermore, a new group of ferments called kinases, or activators, the most important being enterokinase, which converts inactive pancreatic juice into active. The erepsin katabolism of peptones, described by Cohnheim, has made clearer the hitherto unknown fate of these substances, which are now believed to be split up in the intestinal wall.

Finally, Long discusses the relations of chemistry to immunity. He points out first that chemists no longer regard all theories of immunity as "visionary and intangible," and that some of the phrases of the Erlich theory are now a part of the language of organic chemistry. The controversy between Arrhenius and Ehrlich as to the character of the reactions between toxin and antitoxin, whether reversible, as claimed by Arrhenius, or not, is outlined, and the opinion expressed that at present the theories of Ehrlich and his followers, based on the presence, as they claim, of several toxins in the filtrates of broth cultures of diphtheria bacilli, may serve to advance investigation better than the Arrhenius theory, an opinion that probably coincides closely with that of immunologists in general.

We note that Long has emphasized four distinct lines along which physiologic chemistry has made and is making progress, namely, the value of protein in nutrition, the composition of the protein molecule, the soluble ferments, and the chemical relations of toxins and other substances and their antibodies. Add to the achievements outlined in these lines the fundamental rôle that chemistry is known to play in general physiologic processes and in pharmacology, and the overwhelming importance of chemistry in normal and pathologic physiology can not be denied.

ANTISTREPTOCOCCUS SERUM IN THE TREATMENT OF SCARLET FEVER.

Ever since the first careful bacteriologic studies of scarlet fever were made, it has been recognized that streptococci are almost constantly associated with this disease. The earlier investigations were made on the bacteriology of the throats and of the internal organs and bone marrow in fatal cases. Streptococci were found in a large percentage of these throats and organs, but the investigators regarded the invasion by these organisms as of a secondary nature and not as an essential part of the disease. More recently, blood cultures have shown that these organisms can be cultivated from the blood during life in only a small percentage of cases—12 per cent. in Hektoen's series of 100 cases. Baginsky and Sommerfeld, however, found streptococci in all the organs in every one of 82 cases which they examined postmortem. Some of these patients had died during the first days of the disease before there were signs of a secondary infection. So greatly impressed were these investigators with their findings that they have regarded the streptococcus as the etiologic factor of scarlet fever. This view has not been widely accepted, as the weight of evidence is in favor of the view that these organisms are secondary invaders.

In the light of these facts, it is not surprising that antistreptococcus serum should be tried in the treatment of this disease. This has been done by a number of investigators, among whom may be mentioned Aronson, Moser, Baginsky and Charlton. The earlier reports by these men were very encouraging, but it seems that too small a number of patients had been treated to draw conclusions from the results. Furthermore, some of these men are interested in the manufacture of the serum which they have used, and hence are probably somewhat prejudiced in favor of this treatment. Very recently Mendelsohn[1] of Baginsky's laboratory reported a long series of cases (146 in all) in which the patients were treated with Aronson's antistreptococcus serum. The mortality in this series was 9.2 per cent., which is not any better than the results obtained without serum in the mild epidemics. None of the complications were entirely prevented. Severe lymphadenitis was present in 8 per cent. of the cases and in 17 per cent. of those without serum. A larger proportion suppurated of those that were treated with serum than of those that were not injected. Otitis media developed in 13 per cent. of the injected cases and in 15 per cent. of the uninjected; hemorrhagic nephritis was present in 11.6 per cent. of the injected cases and in 12.2 per cent. of the uninjected cases.

This report shows that there is no great difference between the cases that are treated with antistreptococcus serum and those that are treated without the serum. In view of the fact that the streptococcus plays such an important part in the complications of this disease, it would seem that the failure in getting results with antistreptococcus serum must be due to improper methods of preparing the serum. We know that none of the antistreptococcus sera thus far prepared has demonstrable therapeutic value. It seems, therefore, that good results in the serum therapy of scarlet fever might be obtained if we had a more efficient antistreptococcus serum. Aronson's serum is prepared by injecting a horse with streptococcus isolated from a scarlatinal sore throat and made virulent for animals by passage through white mice. Moser's serum is said by some to have given good results. It is prepared by injecting a horse with several strains of streptococci coming from the internal organs of scarlet fever bodies. The organisms are not passed through laboratory animals before they are used in the immunization. Mendelsohn has used this serum on only four scarlet fever patients, but did not notice a marked improvement after its injection. As this series is very small, further trials with Moser's serum are indicated.

1. Deut. med. Wochft., 1905, vol. xxxi, p. 461.

GLYCOGEN IN PATHOLOGIC CONDITIONS.

In addition to the various chemical ingredients constantly found in all animal cells, and sometimes referred to as the primary constituents, there are also secondary constituents which are not found in all cells, at least in recognizable quantities, of which perhaps the most important are fat and glycogen. Glycogen has until recently evaded successful study because it is very soluble in water, and also rapidly disappears from the cell after its death, both of which facts make it difficult to secure material in condition for examination. Methods have been devised, however, which permit of securing well-stained microscopic preparations from fresh material, and control by chemical means shows that the microscopic appearances are a reliable indication of the quantity of glycogen actually present in the tissues. During the process of evolution of these methods many and often erroneous observations and deductions have been made, which have recently undergone a clearing up at the hands of Gierke.[1] Outside of technical considerations, the glycogen question has touched on practical medicine in two chief points. The first is the diagnostic value of the occurrence of glycogen granules in the circulating leucocytes in disease; the second is the diagnostic and prognostic value of the finding of glycogen in the cells of tumors.

So far as available methods go, glycogen can not be detected in all cells under normal conditions. As is well known, it is most abundant in liver and muscle cells, after which in importance come hyalin cartilage and the middle layers of stratified epithelium. On the other hand, ordinary cylindrical epithelium, the pancreas, the nervous system, and many other organs seem quite free from visible glycogen. The usual teaching of the abundance of glycogen in fetal tissues is but partly correct; in

1. Ziegler's Beitr., 1905, xxxvii, 502.

fetal muscle it is very abundant and also in the cartilage, but during early fetal life the liver is quite free, and in other organs the amount of glycogen seems to bear no constant ratio to either the stage of development or the rate of growth.

This idea of a relation of glycogen to cell multiplication seems to have misled earlier observers, who suggested the existence of a correlation between the amount of glycogen in pathologic tissues and the rate of their growth. For example, Brault found glycogen in all malignant tumors irrespective of nature or origin, and, believing it to vary in amount with the energy of their growth, suggested the estimation of glycogen content as a matter of prognostic significance. The most recent studies give quite different results. Glycogen is not present in all tumors by any means, nor is it an index of their embryonal nature. It is perhaps most abundant in hypernephromas, although normal adrenal tissue is free from or poor in glycogen; in squamous celled carcinomas with hornification it is also abundant, while less so in sarcomas, and altogether absent in many cylindrical celled carcinomas. Granulation tissue cells often contain glycogen and, therefore, it may be present in tubercles and gummas, but not in a manner or quantity at all characteristic or significant.

It is impossible, on these findings, to attribute the occurrence of glycogen in pathologic cells either to an embryonic condition of the cells or to their origin, and there seems to be no specific cause for such abnormal accumulation of the substance. While the circulating leucocytes frequently contain much glycogen during suppurative processes, they may react in the same way to other injuries. Likewise, a connective tissue cell in the vicinity of an abscess, a foreign body, or a tumor, may or may not take on glycogen. Gierke has made the interesting observation that the conditions under which this glycogenic infiltration occur are almost precisely those under which fatty changes are produced, and the two processes go hand in hand. For example, in an infarcted area fatty degeneration occurs in such cells as are deprived of their blood supply but which still receive some nourishment from diffusing blood plasma—that is, the cells about the periphery. Glycogen is also found in the same cells, appearing usually before the fat, which later may entirely replace it. This fatty accumulation is attributed to lack of oxygen, with resulting lack of combustion and accumulation of fat, and Gierke considers the accumulation of glycogen to be due to exactly the same cause. Glycogen is usually found only in cells with an intact nucleus—after the cell dies the glycogen disappears rapidly, although the more stable fat may remain or may even increase. Glycogen and fat often appear in the same cell, although either may occur alone. In tumors, therefore, the cells accumulate glycogen when their nutrition becomes impaired, just as they may also accumulate fat, but this tendency is more marked in some varieties of cells than in others. Glycogen granules may be found in leucocytes either because of injuries they have received while outside the vessels in areas of inflammation or other lesions, or from the effects of poisonous substances in the blood, or, perhaps more important, from toxic injuries to the bone marrow.

From the results of the work so far performed, it may be considered that the glycogen content of tumor cells is without value as an indication of malignancy, and that glycogen accumulation within leucocytes is produced under such various conditions and in such varying amounts by similar causes as to render it of very questionable diagnostic importance.

STATISTICAL INVESTIGATION OF CANCER.

Recently there has appeared, by Drs. Bashford and Murray of England, an interesting and valuable report on the statistical investigation of cancer, published as one of the scientific reports of the Imperial Cancer Research Fund, under the direction of the Royal College of Physicians of London and the Royal College of Surgeons of England. This work represents the accumulation of a large amount of statistics and has been made possible through the collaboration of the authorities of the metropolitan hospitals, the general registrar's office, various hospitals in Ireland, the officers of the Indian and colonial medical services and also members of the veterinary profession, as well as many public and private individuals.

Through the compilation many valuable and new facts appear which will at least modify our views on some phases of the cancer question.[1] A few of these may be briefly noted:

One important indication from this study is that sarcoma increases in frequency as life advances in much the same way as that long recognized for carcinoma. This fact might suggest that the two types of growth may not be so fundamentally different as often considered. Another suggestive fact derived from a study of the age incidence in man indicates that the age period at which cancer appears in those organs in the human body which disappear early or are active throughout life presents a general parallel to the incidence of the disease in animals with short and long lives. Furthermore, the accumulated data on the frequency of cancer in animals indicate, when age is taken into account, that they are as liable to the disease as man, and that the time at which new growths appear in animals stands in direct relation to the absolute duration of life in long- and short-lived animals.

A study of the cancer question in native races has brought out certain points worthy of mention. While the data as yet are somewhat limited, still those so far collected indicate the occurrence of cancer among all the races and under all climates throughout the empire; and the report further states that there is no reason to anticipate that any race of mankind is absolutely exempt

1. They use the term cancer to include all forms of malignant new growths.

from the disease. The races include those of Malta, Fiji, British Guiana, West Indies, and others remote from civilization. The further interesting fact is brought out that diet exerts no influence on the occurrence of new growths, for just as they are found in both herbivorous and carnivorous animals so they are found likewise in those races whose diet is restricted to either vegetable or animal food, as well as to those that subsist on a mixed diet.

Attention is called to the importance of exercising caution in the interpretation of statistics from localities without taking into consideration the age incidence of cancer. In this way the existence of endemic centers have been thought to occur simply because the total number of individuals and their average age has not been taken into consideration.

Statistical studies of this sort, while not intended, of course, as a means of determining the nature or origin of cancer, are, however, of inestimable value in controlling the conclusions derived in other ways, and they may also serve to indicate new and more favorable points of attack.

THE YELLOW FEVER EPIDEMIC.

New cases in New Orleans are not being quite so rapidly reported, and the mortality rate is steadily falling. Despite its noisy quarantine, Mississippi has some cases that have been concealed since July 20. Harsh quarantine regulations are causing widespread misery, while some enlightened communities have stamped out fever without restricting travel. It has been suggested, wrongly it is hoped, that most of the shotgun quarantines will come down when local merchants have disposed of their stocks at famine prices. If these quarantines are, indeed, mercenary in motive rather than due to cowardice and ignorance of rational methods of preventing disease, they mark one of the lowest depths of human depravity. On the Louisiana plantations the disease is finding ideal conditions for rapid spread, and the authorities find therein some of their greatest difficulties. Despite a few shortcomings, the campaign in the city of New Orleans is being valiantly fought and with real success, which will soon begin to show more graphically in the statistics. Over 40 officers of the United States Public Health and Marine-Hospital Service are now on duty in the infected area, and two have contracted the disease. While the Southern rail gateway into Illinois is being closely guarded, a few cases have developed in northern Missouri near the Iowa line and just across the Mississippi from Illinois. If the disease once obtained foothold in southern Illinois, it probably would be difficult to eradicate, if the stegomyia exists there in sufficient number, as the conditions are very difficult for effective sanitary work. The latest news from the scene of the epidemic continues to be encouraging. For instance, in New Orleans the cases that have occurred in the best quarter of the city, that above Canal street, have been mild and so far have not given rise to secondary cases. In other words, among the better classes the disease does not spread when the cases are properly cared for. Unquestionably the epidemic is checked, but continued hard work for three or four weeks yet will be necessary to show whether it can really be stamped out before frost kills the infection-bearing mosquitoes. While physicians hope for this, it will be highly satisfactory if modern methods do no more than cause the number of cases steadily to dwindle.

ETHICS IN THE COUNTY SOCIETY.

The peccadillos of a member of a county society, especially in the smaller communities, are pretty sure to be known to the other members. Very often the offending one in the little matters of professional conduct is guilty by reason of defective training and faulty early environment. Many an offender will cease his disturbing practice if the facts in their true light are kindly and tactfully laid before him. In other words, it should be the function of the county medical society to educate its members in professional conduct, and to avoid, so far as possible, trials and penalties. Rarely is there a society not numbering on its rolls at least one member capable of successfully playing the part of reformer and peacemaker. To him should be allotted the task of censor. Many an offender against professional courtesies and customs will agree to observe all the proprieties if he be properly approached. To begin an effort at reform by bringing charges against the culprit and hailing him before a trial committee does not offer the least hope of making him a better man. For instance, through ignorance or thoughtlessly, a physician occasionally permits himself to advertise in a way that offends his fellows. To win such a man over to the cause of clean medicine, charges and a trial are wholly ineffective, while in a majority of such instances private and kindly moral suasion will accomplish that end by making such a one desire to stand clean among his fellows. To this end organization in itself is a great first step. The society germinates and fosters a sense of professional pride. These things are not simply desiderata of the future. In many places they are long-established facts. Here and there over the country well-organized county societies have been blessed with members who love peace and who are willing to expend effort to rescue a misguided colleague. These men have not been so few as might be thought from the little we hear of them. Let us do away with unnecessary criticism of each others acts and have more peace conferences and fewer battles.

THE ELIMINATION OF THE MOSQUITO.

On page 585 of this issue of THE JOURNAL, Dr. Doty discusses the possibility of getting rid of that almost universal nuisance, the mosquito. It is only of late years that the habits of the insect have been carefully studied with a view to its extirpation, and yet there is much room for further knowledge which Doty points out will probably be gained by investigations now in progress. We know enough, however, to relieve ourselves, to a large extent, of the danger and discomfort caused by these pestiferous insects. The success of mosquito-killing methods in Havana and in some places along our Atlantic coast is a very encouraging indication of what is possible with well-directed systematic effort. If we had been more observing in years past,

we should probably have seen the connection between the decrease of malaria and of mosquitoes in many sections of our country. It is a well-known fact that, with cultivation and drainage, malaria disappeared in extensive regions of the Middle West, but the coincident disappearance of the mosquito to any extent whatever was overlooked. Whether it will ever be possible completely to eliminate the danger from the mosquito in tropical regions with heavy rainfall is, perhaps, doubtful. We may have to rely largely on the quinin prophylaxis method of Koch in many localities, but a great deal can undoubtedly be done. The fact that the mosquito is so much a home dweller, seldom going far from its place of origin, is a very important one, but its conveyance by steamers, railroad trains and other methods of rapid transit makes any disease of which it is the host more and more a world peril. The opening of the Panama canal may be, as some fear, the cause of the introduction of yellow fever into the Orient, and it is to be hoped that by the time that work is achieved the mosquito question will be more a matter of human control than it is at the present time. The stegomyia is apparently a cosmopolitan resident within certain degrees of latitude, a fact which involves very unfortunate possibilities if we fail to obtain a more perfect control of its migrations than we seem to have at present. The situation, however, is far more encouraging than it was as regards the possible propagation of yellow fever, notwithstanding recent developments. We have probably not yet learned all the iniquities of the mosquito, and it would be well if a still more general campaign of popular education were carried on against it.

UNCINARIASIS IN CALIFORNIA.

Dr Blumer's address on tropical diseases at the Portland session of the Association has apparently received a rather striking illustration from conditions existing in San Francisco. It is stated by the San Francisco *News Letter* that out of 115 Porto Ricans examined in that city recently, over 60 per cent. were found to be suffering from uncinariasis, and it is probable that this apparently represents the condition of the hundreds not examined. The infection seems to be fairly introduced and while it is not probable that the evil prognostications of the newspaper will be fully realized, the matter is one that deserves some public attention. The climate of California is not unfavorable to the spread of the disease and while it is not common in cities, if it should extend among the truck gardeners near San Francisco, there may be possibilities of evil to be considered.

UNWISE AND UNTIMELY EXPERIMENTATION.

It has almost invariably occurred in the history of epidemic diseases that "sure cures" are suggested, sometimes with considerable vehemence, by individuals of more or less scientific attainment, which do not stand the test of scientific investigation or experience. The present yellow-fever situation in New Orleans has been no exception to this rule, and the newspapers of the last few days have been full of notices of the prophylactic arsenic treatment of yellow fever advocated by Dr. R. B. Leach of St. Paul, Minn. According to the newspapers, he claims that the ingestion of one grain of arsenious acid in 1-100 grain doses, or continued until the epidemic ends, will render the individual immune from yellow fever. Incidentally, it is reported that thousands of boxes of arsenious acid tablets have already been sold to citizens of New Orleans. The employment of arsenic is not new. In the form of cacodylic acid (dimethylarsinic acid), as mentioned in THE JOURNAL, Aug. 17, 1901, arsenic acts "by stimulating the reproduction of cells, increasing the number of red blood corpuscles, rejuvenating the tissues and conferring on the economy an extraordinary degree of resistance to morbid influences." Dr. Leach claims that he is cognizant of from 16,000 to 20,000 tests of arsenization in yellow fever, but that these tests were made before the stegomyia had been taken into consideration. The well-known alterative properties of arsenic led to its use in yellow-fever epidemics in Brazil five years ago, and a monograph on the subject was written by Dr. Eduardo Magalhaes, a member of the Brazilian Yellow-fever Commission. If Dr. Leach's claims are valid, why were not reports made through accredited medical channels, and why has he delayed until now, in the midst of an epidemic, to give forth to the world the results of his experience and experiments? Under the conditions which at present prevail in New Orleans, the promulgation of any theory of this kind, not based on scientific principles, is dangerous to those who follow it and to others, because those who have implicit faith in the theory will not pay the proper attention to the cleaning of their premises, to the screening of their cisterns, to the oiling of places where mosquitoes might breed, and to other prophylactic measures. While Dr. Leach undoubtedly is single-minded in his advocacy of arsenic as a prophylactic of yellow fever, and while he is undoubtedly honest in his offer to submit himself and others to the test of inoculation after arsenization, he is gravely in error in making the claims he does for a procedure which is nothing more than empiric, and the following out of which, to the exclusion of approved hygienic measures, must entail grave danger to the community at large.

THE ANNUAL RAILROAD HOLOCAUST.

While few of the vast number of persons carried on American railroads suffer death or injury, the actual casualty figures are appalling. Undoubtedly the accidents of travel in America are excessive. Comparison with the casualty statistics of British railroads has so often been made that there is no need to reproduce the figures, but they are decidedly unfavorable to the railways of the United States, even though the British roads are more crowded and pass through more closely built up territory. Speed is not a factor, as there is no preponderance of accidents to the faster trains and as Great Britain has proportionally more fast trains than the United States. The annual report of the Interstate Commerce Commission for 1904, issued Aug. 16, 1905, presents the following alarming figures, to which are added for comparison those of the previous year:

	1903.	1904.	Increase per cent.
Passengers carried	604,891,535	715,419,682	2
Number of employes	1,312,537	1,296,121	—1¼
Deaths	3,554	10,046	183
Non-fatal injuries	45,977	84,155	83
Passengers killed	321	441	37
Passengers injured	6,978	9,111	31
Employes killed	3,233	9,605	197
Employes injured	39,004	75,044	92
Passengers killed, 1904, to passengers carried as 1 to			1,622,267
Passengers injured, 1904, to passengers carried as 1 to			78,523

The statistics for years prior to 1903 exhibit, on the whole, a steady increase in tragedy. The figures are presented for information and for study. It is not in the province of medical men to ascertain the cause of this disgrace of American railroading nor to prescribe a remedy. Those functions are left to railroad men and lawmakers, with the assurance that there is herein plenty of work for both. The report shows that the installation of life-saving devices, such as automatic couplers, automatic signals, air brakes and safety switching devices, has progressed satisfactorily. Why, then, 37 per cent. increase in passengers killed and 197 per cent. in employes killed? The pages of railway journals will be scanned eagerly for a satisfactory reply. Are British railway employes of a higher grade? Are the railways of the United States not enforcing the rules that most of them have against intemperance among employes? Are dividends on watered stock given preference over expenditures for rigid and genuine "block system," elevated ways in cities and ample switching facilities? We can only ask questions. Physicians know, however, that a certain proportion of all sorts of accidents are due to the sudden onset of peculiar morbid mental states in those entrusted with hazards. This subject, in the light of the statistics here presented, demands a close and scientific investigation. Much useful effort is constantly applied to the mechanical problems of railroading, and improvements in this direction seem fully abreast of the times; but there is a most lamentable lack of any satisfactory study of the employes, i. e., of the psychology of railroading.

SMOG.

At a recent health congress in London, a member used a new term to indicate a frequent London condition, the black fog, which is not unknown in other large cities and which has been the cause of a great deal of bad language in the past. The word thus coined is a contraction of smoke fog "smog"—and its introduction was received with applause as being eminently expressive and appropriate. It is not exactly a pretty word, but it fits very well the thing it represents, and it has only to become known to be popular. London is undoubtedly the proper place for its coinage, for it is said to surpass all other places in the opacity of its smog, but so far as mere darkness is concerned some other British and American cities would afford ample justification for the use of the term.

THE PERILS OF THE LUNG TESTER.

In all our large cities there are many slot machines which, while morally innocent, have serious sanitary drawbacks. We refer to the lung testing apparatus that are found in places of amusement, saloons, etc. From a sanitary point of view there are few such appliances that are more objectionable and it is not necessary to specify why such is the case. We have not heard, however, of any general crusade against their use excepting in the city of Montreal where, though suppressed by the health authorities some years since, they have again crept in and become an insanitary nuisance calling for renewed action by the board of health. While it may seem desirable to some occasionally to test their lung capacity on these public machines, a little of the enlightenment that is going round in regard to tuberculous and other infections might be more properly applied to them than to public telephones and other comparatively innocent, but possibly or remotely dangerous apparatus.

Medical News

ALABAMA.

Hospital Reopened.—The City Hospital, Huntsville, which has been closed several months for repairs, was reopened August 15.

Hospital Company Organized.—The Union Street Private Hospital Company of Selma was organized August 9, with a capital stock of $10,000 and the following officers: Dr. Samuel G. Gay, president; Dr. John N. Furness, secretary, and Dr. Barney B. Rogan, treasurer.

Fined for Illegal Practice.—Dr. Thomas P. W. Brooks, Hackleburg, professing to be a graduate of the Georgia College of Eclectic Medicine and Surgery, was found guilty of practicing without a license, fined $25 and costs, and prohibited from practicing until he obtained a license.

Hospital Staff Elected.—The following visiting staff has been selected for St. Margaret's Hospital, Montgomery: Gynecology—Drs. Robert N. Pitts, Arthur H. Montgomery, G. J. Griel and J. H. Blue; surgery—Dr. Robert Goldthwaite, J. Norment Baker, William H. Hudson and Samuel A. Billing; medicine—Drs. Joseph L. Gaston, Milton L. Wood, John M. Sadler and Wooten W. Wilkerson; eye and ear—Drs. Paul S. Mertens, Charles A. Thigpen, William G. Thigpen, George A. Dennis and Henry S. Persons; pediatry—Drs. Charles T. Pollard, Forney C. Stevenson, Milton B. Kirkpatrick and Frank H. McConnico; genitourinary—Drs. Gibson Reynolds, Louis D. Robinson and H. T. Lay; pathology—Dr. Thomas C. Thorington, and advisory board—Drs. Charles A. Thigpen, chairman; J. Norment Baker, secretary; Joseph L. Gaston, Wooten M. Wilkerson and Robert Goldthwaite.

Personal.—Dr. Joseph D. Heacock, Birmingham, has been appointed a member of the health board of the Jefferson County Medical Society.——Dr. William W. Harper, Selma, is ill with typhoid fever.——Dr. William D. Pettus, Republic, who has been seriously ill for two months, is improving.——Dr. Wilbur F. Sadler, Montgomery, in a "personal difficulty" August 6, cut W. R. Barrett in the left temple. The wounds "are not regarded as at all fatal."—Dr. R. C. Woodson, Birmingham, has returned from Europe.——Dr. Wallace R. Bishop, Talladega, has been elected a member of the board of censors of the Talladega County Medical Society, vice Dr. T. Caffrey, removed to Dallas County.——Dr. Samuel H. Lowry, Huntsville, was stricken with paralysis July 6.——Dr. John D. S. Davis, Birmingham, has had conferred on him the degree of LL.D. by the Southwestern University, Jackson, Tenn.

ARKANSAS.

Van Leer Acquitted on Technicality.—Dr. Samuel C. Van Leer, Hot Springs, who has been under the ban of the Federal Medical Board and in trouble with the United States courts, because he prescribed hot-water baths not in accord with the regulations of the reservation, was acquitted on a technicality of procedure, August 7.

The State Board.—Drs. John W. Meek, Camden; William Crutcher, Pine Bluff, and Oscar E. Jones, Newport, are the newly appointed members of the State Board of Medical Examiners. The board reorganized July 11 and elected the following officers: President, Dr. M. L. Norwood, Lockesburg; vice-president, Dr. George V. Poyner, Green Forest; secretary, Dr. Joseph P. Runyan (re-elected), and treasurer, Dr. Ben L. Harrison, Jonesboro.

The "Drumming" Evil.—A plan is being devised by which a warning circular as to doctors' drummers may be distributed on all incoming trains by an officer under the direction of the mayor of Hot Springs. The Business Men's League is taking up the matter with the city authorities, with a view of determining the advisability of such steps.——On August 3 Alva Moore was arrested on two complaints of drumming for the Helena flats.——T. W. Standford, who was arrested on July 7, charged with a similar offense, was acquitted.

CALIFORNIA.

Manson Gives Lane Lectures.—Sir Patrick Manson, commenced the course of nine Lane lectures at Cooper Medical College, San Francisco, August 14.

Rapid Work on Hospital.—Two of the six buildings which are to make up the Merritt Hospital, Oakland, will be ready within three months. One of these is an operating pavilion, and the other a ward building three stories high.

Personal.—Dr. Stanley P. Black has been elected secretary of the Pasadena Board of Health and health officer.——Dr. Ruth A. French, Petaluma, was kicked by a horse, August 2, and sustained a fracture of the skull.——Drs. Francis M. Pottinger, Los Angeles, and George H. Evans, San Francisco, have been appointed delegates to the International Tuberculosis Congress.

Soon Loses License.—Dr. James V. Calhoun, San Francisco, recently graduated from Cooper Medical College, had his license cancelled by the State Board of Medical Examiners, August 2. It was alleged that Dr. Calhoun had advertised by means of a printed card as a private specialist, offering consultation and examination free. It was also alleged that his card contained a "grossly improbable statement."

Joint Sanitarium for Consumptives.—County Physician C. E. Stone, Marysville, proposes that steps be taken to unite with other counties of northern California and establish a joint sanatorium for indigent patients afflicted with consumption. His idea is to have the counties divide the cost of maintaining the institution, and that each send to it such patients as would otherwise be kept in separate county hospitals. By the present system such patients can not be isolated, and are allowed to mingle freely with other patients, some of whom are confined to the hospital only temporarily.

License Trials.—Dr. Walter E. Lilley, Merced, charged with practicing without a city license, was discharged August 10. ——Rudolph H. Garber, San Francisco, was arrested August 12, charged with practicing medicine without a license.——Dr. F. P. N. Van Handghen, Watsonville, was arrested for illegal practice July 18.——Fraud orders were issued July 18 against "Drs." R. Brook Sterling and R. H. Weston, San Francisco, for illegal use of the mails.——"Dr." T. J. Batiere, San Francisco, for whom a warrant was issued July 26, has fled from the city.——"Dr." S. Eve, Watsonville, under indictment for illegal practice, has left the state.——"Drs." Frank Watson and Josefa Dean of Watsonville have been arrested, charged with practicing medicine without a license.——"Dr." G. G. Sanchez, Bakersfield, is awaiting trial for alleged practice without license.——Warrants were issued for the arrest of three Chinese doctors of San Francisco, Tom She Bin, Tong Po Chy and Wong Him, on August 5.

COLORADO.

A New Sanatorium.—Dr. Henry B. Oertel has opened a sanatorium in Pueblo, thoroughly equipped for the care of obstetrical and surgical cases.

Personal.—Dr. Miller E. Preston has been appointed police surgeon of Denver, vice Dr. Francis E. Prewitt, resigned.—— Dr. Maurice Kahn, Leadville, has been appointed captain and assistant surgeon, N. G. Colo.

Correction.—Dr. William W. Bredin asks that the statement in THE JOURNAL of July 8 (page 110), be corrected. He gives the following as the facts in the case: "The city council of Denver has recently passed an ordinance to the effect that if a physician has no cases of confinement, he must send in a monthly report to that effect. I did not attend any cases of confinement during the month of May, and I failed to state that fact as many others did promptly on the first of June. . . . I was not fined . . . for not sending or reporting any birth, neither was I fined at all."

DELAWARE.

Personal.—Dr. William Marshall, Jr., has been appointed resident physician at the Delaware Hospital, Wilmington.

Unlicensed Practitioner Fined.—Charles M. Suit, Wilmington, accused of practicing medicine without a license, compromised by agreeing to refund money to persons he had been treating for cancer, and paying a fine for peddling without a license. He then left Wilmington.

Typhoid Fever in Wilmington.—An epidemic of typhoid is threatened in Wilmington, 41 cases having been reported, with, however, but few deaths. The outbreak is attributed to the pollution of the Brandywine River, from which the city receives its supply of drinking water, at West Chester and other places in Chester County, Pa.

DISTRICT OF COLUMBIA.

Personal.—Dr. William M. Sprigg has been appointed a member of the Board of Medical Examiners, vice Dr. Joseph Taber Johnson, who declined reappointment.——Dr. Frank P. Vale, police surgeon, has resigned.

Beginning of New Freedmen's Hospital.—On August 4 the first stake marking the site of the new Freedmen's Hospital, for which Congress appropriated $300,000, was driven by the superintendent, Dr. William A. Warfield.

Fined for Non-Appearance.—Drs. D. Percy Hickling and Frank P. Vale, were each fined $25 and costs for contempt of the Supreme Court of the District of Columbia, the contempt lying in their failure to appear after having been subpoenaed to testify in lunacy cases.

Typhoid in Washington.—The outbreak of typhoid fever in Washington is said to be greater in severity than any preceding epidemic, even the notable one of 1903. Since July 1 more than 300 new cases have been reported. It is stated that the new filtration beds would be ready August 19, and that after that date pure water would be supplied to the city.

ILLINOIS.

New Hospital Dedicated.—The Evangelical Lutheran Hospital at Granite City, erected at a cost of $40,000, and having accommodations for 96 patients, was formally dedicated August 13.

Princeton Hospital.—The Princeton Hospital and Sanitarium, which has been closed for a time, has been purchased by Dr. Matthew H. Blackburn and will soon be thrown open to the public.

Chooses Hospital Staff.—The board of Lakeview Hospital, Danville, met August 7 and elected the following staff for the coming year: Medical—Drs. Elmer B. Cooley, Henri S. Babcock, Abraham L. Fox, Francis W. Barton and Fred Baumgart, Danville; Dr. Jesse H. McIntosh, Vermilion Heights, and Dr. Jacob G. Fisher, Catlin. Surgical—Drs. William A. Cochran, Thomas E. Walton, A. Merrill Miller, Charles E. Wilkerson, Stephen C. Glidden and George L. Williamson, Danville; and eye and ear, Dr. Elbert E. Clark, Danville.

Chicago.

Home from Europe.—Drs. James B. Herrick and Henry Harms have returned after a summer in Europe.

Laboratory Moves.—The demolition of the county building has necessitated the transfer of the municipal laboratory to temporary quarters at Michigan Avenue and Fourteenth Street.

The Weekly Mortality.—The deaths for the week ended August 19 numbered 577, an increase of 38 over the previous week and of 140 over the corresponding week of 1904. Acute intestinal diseases caused 145 deaths; violence, 69; consumption, 46; nephritis, 35; nervous diseases, 33; heart diseases, 31, and cancer, 26. Among the important causes of death showing decreases are apoplexy and heart diseases, each 6 less; bronchitis and sunstroke, each 3 less; acute intestinal diseases, 55 less, and pneumonia, 14 less. Among those showing an increase are Bright's disease, 5; consumption, 10; cancer, 4; nervous diseases, 16; whooping cough, 4.

IOWA.

Sanitarium Opened.—Maple View Sanitarium, West Union, has been opened recently under the management of Drs. Frank B. Whitmore and Allen G. Rennison. The sanitarium has accommodations for 12 patients and is the only hospital in Fayette County.

It Costs to Be an Itinerant.—The Dubuque city council has amended the present ordinance by fixing the license for traveling doctors at $5 a day straight. If the doctor carries a band or concert company $10 a day extra will be charged for the first day and $5 for each subsequent day.

Hospital Accepts Conditions.—The Council Bluffs Woman's Christian Association has accepted the gift of $40,000 offered by J. D. Edmundson, Des Moines, under the conditions that

the new hospital should be known as the Jennie Edmundson Memorial Hospital, in memory of his deceased wife; that the association provide a site and secure an additional $10,000.

KENTUCKY.

Off for Europe.—Dr. John D. Maguire, Lexington, sailed for Europe, July 22.——Dr. Stephen Sharp, Jr., Covington, sailed for Europe, August 6.

Kentucky Graduates.—On July 12 a class of 48 was graduated from the Kentucky School of Medicine. Dr. William H. Wathen delivered the announcement, and John H. Leathers conferred the degrees.——Kentucky University Medical Department graduated a class of 58, June 30. Rev. E. L. Powell delivered the doctorate address and Dr. Joseph B. Marvin conferred the degrees.——Dr. James M. Bodine delivered the faculty valedictory at the graduating exercises of the University of Louisville Medical Department, June 29, when a class of 25 received diplomas from Hon. Theodore L. Burnett.——Hospital College of Medicine, Louisville, graduated a class of 89, July 3. Addresses were made by Dr. Thomas Hunt Stucky and Dr. J. H. Blanton.

Sues State Board.—Dr. Samuel J. Fryer, Louisville, has entered suit against the State Board of Health to compel that body by mandatory injunction to issue him a certificate to practice medicine. He claims that he graduated from the Hospital College of Medicine and applied to Dr. W. H. Wathen, the county referee, for a certificate in July, 1903, and presented his diploma. He made a second application in January, which was also refused. The plaintiff claims that he graduated before the law requiring examinations went into effect, though after it was passed. For this reason he contends that he should not be subjected to the examination. Another member of the same class, it is said, recently sued the board and received his certificate.

MARYLAND.

Money for Hospital.—Toward building the proposed Union Hospital of Cecil County at Elkton, $4,500 of the $5,000 required to secure an appropriation from the state, has been obtained.

Smallpox.—The outbreak of smallpox in Calvert County is said to be limited to three cases on Fishing Creek, near Pushaw Station, on the Chesapeake Beach Railroad, who are under the care of Dr. J. L. Brayshaw, Friendship.

Fail to Report Tuberculosis.—There is much complaint by the State Board of Health that physicians fail to report cases of tuberculosis. This is pretty general throughout the state, notwithstanding the law passed at the last legislature requiring reports, and affixing a penalty of $100 fine and not exceeding six months' imprisonment, one or both, in the discretion of the court, for its violation. Publicity in such cases is forbidden. The secretary of the board declares his intention of enforcing the observance of the law.

Baltimore.

Pharmacist Dies.—Charles Schmidt, associate professor of pharmacy, University of Maryland, died August 14 from typhoid fever. He was director of the laboratories of Messrs. Sharpe & Dohme.

Personal.—Dr. Henry M. Hurd of the Johns Hopkins Hospital has gone to the Adirondacks for the remainder of August.——Dr. William Sidney Thayer has gone to Cape Breton for the remainder of the summer.——Dr. Gordon Wilson has gone to North Hatley, Canada, for some weeks.——Dr. William M. Dabney has gone to Portland.——Dr. William M. Welch is in Paris.——Drs. James Bosley, John B. Schwatka and J. D. Norris have gone to the Antlers, I. T., where they will spend three weeks in hunting big game.——Dr. George A. Fleming is at Bar Harbor, Maine.

NEW YORK.

Attempt to Bribe Inspector.—Dr. William S. Goodale, Buffalo, tenement house inspector, accuses an owner of a tenement house with having offered him a bribe of $25 provided that he failed to report violations of the tenement house ordinance.

Improving Nassau Hospital.—This institution, located at Mineola, L. I., will be provided with a children's ward, ...et kitchen, dressing room and more private rooms by Mrs. W. K. Vanderbilt, Jr. The addition will be about as large as the present building, and the ground has already been broken.

Organize Medical Library Association.—Physicians of Jamestown have organized this association to maintain a library at the W. C. A. Hospital. Dr. Era M. Scofield was elected president; Dr. Jane L. Greeley, vice-president; Dr. John W. Nelson, secretary, and Dr. John H. Wiggins, treasurer.

New York City.

Personal.—Dr. Henry Belt was thrown from his carriage in an accident at Narragansett Pier, R. I., breaking his arm and sustaining several lesser injuries.

New Tuberculosis Camp at Coney Island.—The system of treatment which is being carried on is the same as that used at Sea Breeze House. This is a summer hospital for the treatment of surgical tuberculosis, and was opened under the direction of Dr. Napier. Twelve children suffering from various forms of bone tuberculosis are now being treated in the hospital, which is a tent on the grounds of the reception hospital.

Examine Subway Air Again.—A large assortment of samples of subway air has been collected from different portions of the subway and from the basements of department stores, factories, tenements, etc., which Dr. George A. Soper, consulting sanitarian of the Board of Health, is analyzing for the purpose of ascertaining the relative conditions of the atmosphere in these various localities. Dr. Soper will make a definite report in about two weeks.

Healer Fined and Jailed.—For swindling poor folk of the East Side, posing as a physician, "healer of the sick," Alfred Meyer, a former convict, was sentenced August 4 in the Court of Special Sessions to eleven months in the penitentiary on Blackwell's Island, and to pay a fine of $500 or to serve in prison one day for each dollar not paid. There were more than 500 complaints against Meyer, of which the chief probation officer said he had personally investigated 150 and found their stories true.

Fight Over Bellevue Bids.—An application to make permanent a temporary injunction granted by Justice Amend restraining the trustees of Bellevue Hospital from awarding the contracts for pavilions A and B of their new building was heard by Justice Dowling in the Supreme Court. The action was brought by a taxpayer, who sets up the claim that the work was awarded to one who had not made the lowest bid and also because it was not made at the regular time and place of meeting of the board of trustees.

Typhoid Fever Spreading.—This disease is spreading in both Manhattan and Brooklyn. From August 12 to August 18 148 cases were reported to the Health Department. Of the new cases 27 were in the Bath Beach district. The reports from this district have not been in the least exaggerated. Policemen have been stationed at the bathing houses in the neighborhoods of the outlets of sewers, to warn people away, as it seems almost certain that some of the cases are due to bathers carelessly swallowing water in this vicinity.

Bakers' Strike and Tuberculosis.—As a result of the strike among the Kosher bakers on the East Side the Board of Health has made an investigation and issued the following statement: "While tubercle bacilli may be present on the hands of the bakers and be mixed with the dough, yet they are almost certainly killed during the process of baking. This destruction is still further insured by the bread being in the moist state. It is remarkable that among 2,400 patients applying for treatment at the tuberculosis clinic of this department from March 1, 1904, to March 1, 1905, not a single one followed the baking trade."

Many Diseased Children.—The Health Department, under the direction of Dr. Biggs, just completed an important investigation into the health of some of the school children of this city. Out of 13,941 children in four primary schools, 6,294 required medical attention for some abnormal condition. They were all in poor quarters, but the worst quarters for disease were avoided in order that the results might be taken in general. The complete result is as follows:

Bad nutrition	1,002
Swelling in anterior glands	2,904
Swelling in posterior glands	706
Chorea (nervousness)	136
Cardiac disease	232
Pulmonary disease	204
Skin disease	227
Deformity of spine	118
Deformity of chest	162
Deformity of extremities	210
Defective vision	3,210
Defective hearing	460
Nasal breathing	1,623
Bad teeth	5,814
Deformity of the palate	196
Bad mentality	823
Requiring medical attention	6,294
Total number examined	13,941

Contagious Diseases.—For the week ended August 5 there were reported to the sanitary bureau 402 cases of tuberculosis, with 141 deaths; 223 cases of measles, with 8 deaths; 103 cases of diphtheria, with 21 deaths; 122 cases of typhoid fever, with 13 deaths; 47 cases of scarlet fever, with 1 death;

24 cases of cerebrospinal meningitis, with 12 deaths; 3 cases of smallpox, with 1 death, and 17 cases of varicella.——For the week ended August 12 there were reported 421 cases of tuberculosis, with 165 deaths; 254 cases of typhoid fever, with 26 deaths; 178 cases of measles, with 9 deaths; 177 cases of diphtheria, with 25 deaths; 26 cases of cerebrospinal meningitis, with 19 deaths; 37 cases of scarlet fever, and 12 cases of varicella.

OHIO.

Cincinnati University.—At the request of the medical directors of the City Hospital the Board of Public Service adopted a resolution that hereafter the professor of pathology of the Cincinnati University shall be the head of the pathologic department of the hospital. The directors stated that they had been made convinced of the fact that a professorship of pathology would soon be added to the university staff.

Personal.—Dr. George Fisher, formerly physical director of the Cincinnati Y. M. C. A., has resigned his position of physical director of the Brooklyn Y. M. C. A. in order to become one of the general secretaries of the national committee of the association. He is spending a few weeks in Cincinnati before going to California to strengthen the organization in that state.——Dr. Eugene S. May, Cincinnati, has been appointed local surgeon for the B. & O. S. W. R. R.——Dr. W. Burnett Weaver, chief surgeon of the Cincinnati Traction Company, has resigned, and sailed for Europe, August 16.——Dr. Clyde R. McKinniss, Marion, has been appointed to the staff of the Columbus State Hospital for the Insane.——Dr. Sterling B. Taylor, Columbus, was detailed as surgeon to Troop B, during camp, from July 30 to August 6.——Dr. Frank Winders, Columbus, secretary of the Ohio State Board of Medical Examination and Registration, has tendered his resignation, to take effect Jan. 1, 1906, on account of the increased duties consequent on his election as secretary of the Ohio State Medical Society and editor of the *Ohio State Medical Journal*.

PENNSYLVANIA.

Typhoid in Allegheny.—There are at present 76 cases of typhoid fever under treatment in hospitals in Allegheny. The number of cases not in hospital is estimated by the Pittsburg *Dispatch* at 1,520. Meanwhile the superintendent of the local health board is said to deny the presence of the disease in the city.

Personal.—Dr. William N. Stein, Shenandoah, sailed for Glasgow on the *Astoria*, August 5.——Capt. Louis P. McCormick, Connellsville, has been appointed major and surgeon, N. G. Pa., and assigned to the Tenth Infantry, and Dr. James F. Elder, Beaver, has been commissioned first lieutenant and assistant surgeon in the same command.

Typhoid Fever at Dundaff.—Dr. Dixon, state health commissioner, has detailed Dr. Fred C. Johnson, chief medical officer of the State Department of Health, to make an investigation into the cause of the typhoid fever epidemic at this place, and to institute measures to prevent its spread. Dr. George Fox of Philadelphia will assist Dr. Johnson with the work.

Philadelphia.

Personal.—Dr. C. Albert Bigler, Jr., sailed for Europe on the *Etruria*, August 19.——Dr. J. Howard Taylor, assistant medical inspector in the Bureau of Health, who was rather severely injured by a fall August 16, is rapidly recovering.——Dr. Richard F. Woods was severely burned by the explosion of the gasoline tank of his automobile August 13, but is now recovering from the injury sustained.——Dr. Alfred Stengel, chief of the medical staff of the University Hospital, is confined to that institution with an acute intestinal affection. He has not typhoid fever, as was first reported.

Food Commission's Busy Month.—Since the middle of July Dr. B. F. Warren, state food commissioner, and his assistants have arrested 112 dealers in this city, charged with adulterating food products. All have had a hearing and have been returned to court for trial. The cases only covered five products, namely, 20 milk cases, 19 for alleged adulteration of chocolate cake, 2 for candy, and 9 on the charge of selling adulterated preserves and jam. So far this month there have been 19 cases of alleged adulteration of cake, 1 candy, 5 preserves and 37 on the charge of selling adulterated soft drinks.

Health Report.—The total number of deaths reported for the week aggregated 438, the same as for last week. The deaths in the corresponding week of 1904 aggregated 420. The principal causes were: Typhoid fever, 11; whooping cough, 4; cerebrospinal meningitis, 2; tuberculosis, 42; cancer, 30; diabetes, 3; apoplexy, 22; heart disease, 30; acute respiratory disease, 16; enteritis (under 2 years), 73; enteritis (over 2 years), 13; Bright's disease, 35; railroad injuries, 6; marasmus, 11. There were 185 cases of contagious diseases reported, with 14 deaths, as compared with 152 cases and 19 deaths for the preceding week. There were 125 cases of typhoid fever reported, with 11 deaths, as compared with 100 cases and 14 deaths for the previous week. It will be noted therefore, that typhoid fever is on the increase, though the malady is of a mild type and the mortality relatively low.

GENERAL.

Personal.—Dr. Joseph Ford, United States Army, who has been stationed in Oklahoma, was operated on for appendicitis at the General Hospital at the Presidio, San Francisco. As soon as he has recovered he will go to the Philippines for duty.

May Have Cure for Leprosy.—A later report is given out concerning the cure for leprosy which physicians in the Philippines are said to have discovered. The report states that 25 patients have been treated; of these 6 are reported as being absolutely cured while the others have been benefited. No official statement is received.

American Electrotherapeutic Association to Meet.—The fifteenth annual meeting of this association will be held at the New York Academy of Medicine, New York City, September 19-21. The program includes papers on all branches of electrotherapeutics, including the treatment of cancer and other malignant growths, tuberculosis, syphilis, gonorrhea, etc., by various forms of electricity, radium and its therapeutics, manual therapy, mechanical vibration, etc. Authors of papers include Drs. Rockwell, Cleaves, Massey, Granger, Baer, Snow, Reyburn, Kassabian, Stover, Gibson, Lindsay, Curtis, Roberts, Herdman and Deeks. The secretary is Dr. Clarence Edward Skinner, 67 Grove Street, New Haven, Conn. The chairman of the committee on arrangements is Dr. Morris Weil Brinkmann, 54 West Ninetieth Street, New York.

Mortality on Shipboard Among Immigrants.—Dr. E. T. Chamberlain, chief of the Bureau of Navigation of the Department of Commerce and Labor, reports that during the past three fiscal years ended June 30, 1905, from the ports of Europe 1,932,934 steerage passengers embarked for New York, of whom 423 died on the voyage, or about 22 deaths per 100,000 passengers. Allowing twelve days for the average voyage, the rate is equivalent to an annual death rate of about six and one-half (6.56) per 1,000. The highest monthly rate for the three years was January, the month of smallest travel, 38 deaths out of 87,260 in the steerage; the lowest rate, also 38 deaths, out of 256,838 steerage passengers, was May, one of the months of heaviest steerage travel to New York. Among the immigrants from northern Europe there were 242 deaths out of 1,351,221 steerage passengers; among those from southern Europe 181 deaths out of 581,713. Of the steerage passengers 31,873 were babies under one year, and 116 more were born in the steerage, two mothers dying in childbirth; 126,993 were children over 1 and under 8 years, and 1,774,068 passengers were over 8 years. Under 8 years 211 died; over 8 years, 212. The census figures for 1900 give deaths under 9 years in the United States, so exact comparison is not practicable. In the steerage one and one-third died out of every 1,000 children under 8 years. Only one steerage passenger out of nearly 2,000,000 died on shipboard from accident, and only one from yellow fever. Twenty-three committed suicide and seven disappeared (suicide, accident or murder). The principal causes of death were: Heart failure, 75 (20 children); pneumonia, 64 (37 children); inflammation of bowels, 40 (all children but five); meningitis, 34 (14 children); convulsions, 28 (children); apoplexy, 17; alcoholism, 17; marasmus or weakness, 17 (13 children); tuberculosis, 16 (8 children); bronchitis, 15 (12 children); congestion, 10; 5 children died from scarlet fever and 5 from measles. The remaining 47 deaths were due to 27 miscellaneous diseases.

THE YELLOW FEVER SITUATION.

EXTENSION OF DISEASE—RELATIVELY LOW MORTALITY—SEPTEMBER FEARED—FUMIGATION DAY IN NEW ORLEANS.

Louisiana.

Reinspection and Repair of Screens.—Flying squadrons have been organized to reinspect and repair screens in New Orleans.

Arrested for Failure to Screen.—Hart Newman was arrested August 22 for failure to screen three cisterns at Athletic Park, a resort owned by him.

Personal.—Surgeon Thomas D. Berry, United States Public Health and Marine-Hospital Service, has recovered from his attack of the fever.——Dr. John T. Crebbin, New Orleans, contracted the fever and has been gravely ill.——Surgeon Joseph H. White, United States Public Health and Marine-Hospital Service, has been made an honorary colonel on the staff of Governor Blanchard.

Resigned Rather Than Quarantine.—At Bayou Gaul the health board resigned rather than institute the quarantine demanded by citizens.

Mail Fumigation Unnecessary.—Some towns asked that New Orleans mails be fumigated, but the postmaster, after consultation with Dr. White, in charge of affairs, decided it was unnecessary.

Must Not Ship Bananas.—Surgeon-General Wyman ordered that no banana cars be shipped north from New Orleans on account of inability to destroy the mosquitoes that they are very likely to transport.

Many persons in New Orleans, including President Charles Janvier, president of the citizens' yellow fever committee, have been fined for failure to screen cisterns, etc., in accordance with the new mosquito ordinance. The courts are vigorous in sustaining the measure.

Wanted Militia to Abate Quarantine.—Local quarantines became so annoying that the State Board of Health and the governor considered calling out the militia to enforce the moderation orders of the state board.

Cases Increasing, Mortality Lessening.—There are more new foci in the good part of New Orleans and more prominent people are suffering, but the mortality is steadily less—very small among those well cared for from the beginning.——Nearly all new cases are near the originally infected area.

Fumigation Day.—On Sunday, August 20, nearly 300 tons of sulphur was burned in the effort simultaneously to destroy mosquitoes in every house in the city.——Four or five tons of wire screens are daily shipped into New Orleans.

Good Work of Committees.—The volunteer ward committees of New Orleans, under the splendid leadership of Rev. Beverly Warner, have accomplished wonders. Every room has been inspected. On one day every gutter in the city was salted to kill vegetation and mosquitoes.

Comparative Mortality.—The figures show a decreasing mortality. Comparing as of date August 20, the cases and deaths of this epidemic and that of 1878 we find:

	1878.	1905.
Cases to August 20	1,355	1,397
Deaths	496	201
Percentage mortality	37.	14.

Quarantines Recoil.—Prolonged quarantines are proving costly to the small towns, both directly and indirectly.——When a suspected case occurred at Bon Ami, the town found that absolute non-intercourse quarantines having suspended train service, it could not receive the services of a fever expert whom it asked the State Board of Health to send.——A case at Lafayette on August 1 caused a turning of the tables, as the town, after having been most rigid in its quarantine, now found itself cut off by the neighboring places.

A Second Marine-Hospital Surgeon Attacked.—Dr. Maxine Landry, United States Public Health and Marine-Hospital Service, was reported, on August 22, to be ill with the fever.

Immune Nurse Dies.—An immune nurse who went through the Cuban experience died of a second attack.

Fever Spreads in New Orleans.—The fever has spread to the St. Louis Cathedral and the Court buildings.

Freight Held Up.—Freight for the Isthmus of Panama in enormous quantities is being delayed at New Orleans by the interference with shipping.

Fever in Jail.—An Italian ill with fever spent Sunday in jail and created a panic when brought into court on Monday of this week.

Train Inspection Extended.—Surgeon Young, United States Public Health and Marine-Hospital Service, has charge of the train inspection service running out of New Orleans, and has extended the service in thorough fashion as far north as Memphis, Tenn.

Detention Camps.—On August 17 Camp Wyman had seventy-five inmates and a waiting list of 243; Camp Slidell had twenty inmates and 107 waiting, and Camp Avondale seventy-five inmates with a waiting list of 235.

Cross Purposes.—At Lake Charles the board of health wishes to admit freight from New Orleans but the citizens and municipal officials have thus far prevented such action.

Panic and Scarcity of Food.—Panic exists in the small towns and in those along the Gulf coast there is a scarcity of provisions, due to the many obstructing quarantines.

Conditions Favorable for Spread.—United States Public Health and Marine Hospital Service recognizes that the conditions are favorable for continued spread of the disease, and feels that to restrict it within reasonable limits will be a great measure of success.

Penalty for Not Reporting Cases.—A few of the older physicians even yet are unwilling to report their fever cases. To these Surgeon White has announced that prosecutions are certain and that the penalty will be, not only a fine, but imprisonment.

Banana and Oyster Famine.—Bananas are becoming scarce in New Orleans because of the embargo on fruit steamers from the tropics. The available supply is said to be coming via Mobile, and there is fear that the shipments bring with them a good many stegomyias.——New Orleans is also threatened with scarcity of oysters.

The New Orleans Record.—In New Orleans for the week ending August 12, there were 54 deaths from yellow fever in 112 from all causes, nearly half the week's mortality. Exclusive of negroes, the death rate for the week was 24.80.

The New Orleans record for August 21, 1905, is as follows:

Total cases to date	1,458
Total deaths to date	210
Percentage mortality	14.4 per cent.

Sanitary Work Should be Continued.—Surgeon White, addressing the ward presidents of the volunteer sanitary, emphasizes the necessity of making the organization permanent and continuing the work until, at least, the disease ceases. He said that once a week a "mosquito killing day" would be necessary, and that once every seven days all gutters must be flushed. The cistern inspection must continue and must be thorough. Until screening is perfect, cisterns must be oiled, and with high-grade oil to avoid unpleasant consequences.

Arsenized Devotees Die.—It is reported that 12 of the recent deaths from yellow fever have been of adherents of the arsenic theory exploited by Dr. Leach. A formal letter was issued August 22 by Surgeon J. H. White, United States Public Health and Marine-Hospital Service, and by the president and advisory committee of the New Orleans Medical Society, telling how patients were under treatment who had partaken of the arsenic diet for the supposed sufficient period to render them immune. The letter was drawn forth by the announcement that there would be a mass-meeting of the arsenic adherents Wednesday or Thursday night to denounce the medical practitioners of New Orleans.

The Arsenization Idea.—Some difficulty has arisen from the notoriety attending the visit to New Orleans of Dr. Reginald B. Leach, a homeopathic physician of St. Paul, Minn., who holds that arsenization is a preventive of yellow fever infection. He has talked freely to the newspapers and has addressed public meetings of sympathizers. He announced that he came to New Orleans to give his theory a practical demonstration, by allowing himself to be bitten by an infected stegomyia. He refused to go on with the experiment unless it was conducted by the New Orleans Medical Society, which refused his request, not caring to countenance an experiment that might result in death and not having any active members who could well be spared from the active fight against the disease. Many physicians fear an epidemic of arsenical poisoning, the popular love for a "specific" having led hundreds, after reading Dr. Leach's newspaper interviews and articles, to eat arsenic. Belief in this extraordinary theory has led many citizens of New Orleans to ignore the orders of Dr. White and his assistants. The eaters of arsenic pills have neglected to clean up their premises and screen their cisterns. Orders were issued on August 18 for the instant arrest of all who have failed to obey the mosquito ordinance. The disciples of Dr. Leach held an indignation meeting at which the medical profession and the press were jointly denounced.

Outside Parishes.—Calcasieu Parish, which stopped through traffic on the Southern Pacific, has since ameliorated its restrictions.——Madison Parish barred out freight and drugs as well as passengers. However, a case of fever developed at Tallulah, in the parish.——Rapides Parish has ameliorated its quarantine.——The conditions in St. John and St. Charles Parishes are exceedingly bad, the houses of the poor being full of mosquitoes. Dr. Corput, M.H.S., is in charge and has his hands full. Many are so anxious to get away that crowds wait their turn to undergo the ten days required at the detention camps.——Jefferson Parish had five cases, all imported from the original New Orleans focus. No quarantine was

established, but the cases were promptly and effectively isolated, while a campaign was waged against mosquitoes. The disease has disappeared from the parish, though there is daily mingling of the citizens with the people of New Orleans.

Other Towns.—Gueydan condemns panic quarantines.——Washington announces that it is a clean town, that mosquitoes are exterminated and trains are forbidden to enter the town.——Mansfield admits daily an engine and a mail car.——Baton Rouge has erected a yellow fever hospital, and is busy oiling and screening.——Sporadic cases have occurred at Diamond, Sarpy and Reserve plantation.——Patterson has had a number of cases.——Many cases have been discovered at the mouth of Bayou La Fourche.——Alexandria admits mail.——Algiers, a town of 20,000 population, just across the Mississippi from New Orleans, had a case of yellow fever late in July. The patient was properly screened and mosquitoes were killed. After the lapse of three weeks a house-to-house canvass showed that the disease had not spread.——No new cases have occurred at Shreveport and quarantine is relaxed.——La Place has a number of cases.——Allentown and Pleasant Hill are isolated.——On August 17 the situation near New Orleans was as follows: Diamond plantation, St. Charles parish, twenty-six cases, three deaths; Alexandria detention camp, three cases; Patterson, St. Mary parish, fifty-two cases, one death; Tallulah, Madison parish, three cases, one death; Pointe Celeste, Plaquemines parish, seven cases, one death; Lafayette, two cases; Rayne, two; La Place, twenty-one; Terre Haute plantation, four; Bucktown, one; Willswood plantation, five cases, two deaths; Empire plantation, one; Sunrise, Plaquemines Parish, one; Bayou Cook, one case, one death.——New cases were found on August 18, at Hanson City one, at Shrewsbury two, at McDonogesville one, at Pecan Grove five, as well as six new cases at Patterson, with one death.——The one victim at Alexandria died.——Ouachita has abandoned its shotgun quarantine.——Iberville called off its quarantine but an influx of refuges from infected Bayou Goul led citizens to demand the rigid quarantine, and in consequence the health board has resigned.——On August 21 Hanson City reported eight new cases, Kenna four, Iberville two, Corinne two, and Patterson ten.——Riverside reports, to August 18, forty-eight cases and three deaths.

Funds to Fight Fever.—Governor Blanchard has arranged with bankers to furnish $100,000 as the state's contribution to the New Orleans fund to fight the epidemic.——Three New York life insurance companies—the Mutual, the New York Life and the Equitable—have each been asked for $5,000 contributions.

Interparish Conference.—Lafayette was the scene on August 8 of a conference of officials from the parishes of Calcasieu, St. Landry, Acadia, Vermillion and Lafayette, at which a schedule of uniform quarantine regulations was adopted. This permits re-establishment of through passenger travel and provides five-day detention for those from New Orleans and other infected points, responsible inspectors, uniform certificates, and permits entrance of fumigated baggage.

During two days at Leeville there were found 60 positive cases of fever, 53 suspicious cases and 145 cases of dengue. There are about 300 houses and families there and not a single house but has one or more cases of sickness. The people are distracted. All seem to have lost ambition to work. They are completely demoralized. Two more deaths are reported there.——Patterson reports 15 new cases and no deaths. St. Tammany parish reports a case on the road between Mandeville and Lewisburg. Hanson City reports 6 new cases, Kenner 1 and Sarpy plantation 2. There was one death on Elizabeth plantation in Iberville. St. Rose, in St. Charles parish, has 2 cases and 1 is dead. Corinne plantation, in St. Bernard parish, reports one death. Mississippi City reports 3 new cases.

Other States.

Alabama.—Tuscaloosa is quarantined against all yellow fever points and enforces a two-weeks detention.——The Mobile quarantine against New Orleans is to last until December, unless earlier revoked.——Dr. John Guiteras of Havana, on August 15, addressed the citizens of Mobile on the subject of yellow fever.——The Jefferson County Medical Society at Birmingham, on August 14, decided by unanimous vote to ask for the raising of the quarantine against Montgomery.

Arkansas.—Having secured a state quarantine through the aid of the militia Dr. Cantrell asked local boards to withdraw their quarantines.——Texarkana reports a quarantine death, a quarantine guard having fatally shot a citizen running over the line.

Florida.—State health officer, Dr. Joseph Y. Porter, on August 14, extended the detention period for entry into the state from six to ten days.——The Hillsboro County Medical Society meeting at Tampa was addressed by Dr. John Guiteras of Havana and Dr. Porter, state health officer.——A few cases of dengue at Tampa caused a yellow fever scare.

Georgia.—Augusta has instituted an "absolute non-intercourse quarantine" against all infected places.——Columbus requires twenty days' detention before coming within five miles of the town.——The United States Public Health and Marine-Hospital Service has opened an office in Atlanta, in charge of Dr. Charles P. Wertenbaker, for the issue of health certificates.——Cordele requires twenty-one days' absence from an infected point before granting admission.——The mayor of Savannah has asked Surgeon-General Wyman to throw a cordon of soldiers around New Orleans, allowing no one to leave the city until after having undergone five days' detention under observation.——Atlanta was much displeased with a story in the New York Tribune of August 11 alleging there were at least a dozen concealed cases of yellow fever in that city.

Illinois.—Cairo and southern Illinois is now quarantined against the states of Louisiana and Mississippi, and all fever infected points in other states, and no passengers coming from either of those states or places will be admitted to Cairo unless they can show health certificates signed by a duly authorized and accredited board of health, showing that they have not been in the above-named sections within ten days. Furthermore, the city of Cairo is quarantined against the world, and no person can come into the city from any place unless they can show health certificates showing that they have not been in a fever infected district in ten days.——It was announced from Cairo on August 13 that Dr. Egan of the Illinois Board of Health and Dr. A. T. McCormack of the Kentucky board had arranged all differences regarding certificates and travel. However, on August 21, from the same place it was announced that Illinois would not receive certificates issued at Paducah, Bowling Green, Fulton or McCracken County, Ky., or at Bird's Point, Mo. No one can get into or through Cairo now without a satisfactory certificate of health.——Many refugees from Louisiana are in Chicago, Evanston and nearby places.

Indiana.—Dr. T. Victor Keene, city sanitarian of Indianapolis, has gone to New Orleans to study yellow fever.

Kansas and **Missouri** have a uniform quarantine.

Kentucky.—Two detention hospitals have just been erected by the railroads entering Louisville from the south, to be used to care for persons reaching the city who are sick. Louisville has opened her doors to yellow fever refugees, and Kentucky will not quarantine. Dr. John H. Ward has been appointed an assistant to the Health Office for the purpose of issuing health certificates to travelers who wish to go into districts which have quarantined against other points unless the individual has a certificate of health.——Dr. Vernon Robins, bacteriologist to the Health Department has hatched out several genuine stegomyia mosquitoes from larvæ obtained from a small pond at the station of the Louisville and Nashville railroad.

Maryland.—Baltimore reports the stegomyia present.

Mississippi.—Jackson does not permit through passengers to change cars at the city station nor to get off a train for lunch.——Box cars are not permitted to stop in the city, whether disinfected or not.——The members of the Italian colony have been notified that if they permit any friends from other cities to visit them the entire colony will be held ten days in detention camp and then "put on the rock pile or in jail."——Vicksburg has guards patrolling the river front to prevent persons landing from boats, the guards being under orders to shoot anyone disobeying orders not to approach the shore.——Natchez is *incommunicado* with the entire world, and Jefferson, nearby, refuses to admit citizens of Natchez. Shotguns on both sides enforce the order.——Governor Vardaman commended the citizens of various towns who refused admission to fumigated freight from New Orleans.——The governor and various health officials of the state have bitterly accused New Orleans and the Louisiana State Board of Health of bad faith, double-dealing and concealment of cases of yellow fever.——Tupelo bars out passengers and freight from infected points.——Sardis, Oxford, Brookhaven, Haselhurst and Terry have quarantines.——Canton admits no one without a ten-day health certificate, and forbids relays of train crews on the Illinois Central Railway.——Tutweiler, Oakland, Greenville, Neabit, West Point and Granada are quarantined.——Dr. John F. Hunter, Jackson, secretary of the State Board

of Health, on August 8 courageously announced that he regarded "shotgun quarantine as wholly useless," and urged that where in force they should be abandoned. He advised the people to turn their attention from quarantines to sanitation and to extermination of mosquitoes.——On August 10 the Board of Health announced that there was not a case of yellow fever in the state.——On August 16, 11 cases of yellow fever were found at Mississippi City and 5 more on the succeeding day. It is said cases have been concealed there since July 20. In any event Governor Vardaman says no more about the perfidy of New Orleans, and now advises all Mississippi communities fully to co-operate with the efforts of the Marine-Hospital Service and to accept its certificates.——A new case occurred August 21 at Mississippi City.——Governor Vardaman has arranged with members of the Legislature for authority to borrow $50,000, or as much thereof as may be needed, to meet the necessities of the epidemic and has pledged himself to use the funds as economically as possible. ——The suspicious case at Yazoo City was found by Dr. Wasdir, United States Public Health and Marine-Hospital Service, to be one of pernicious malarial fever.——Dr. Hicks, health officer of Vicksburg, on August 14 sent back to New Orleans a carload of sugar which had been partly unloaded before discovery. The board of health decided to prosecute the railroad for delivering the sugar.——There appears good reason to believe that the infection of Mississippi City did not come from New Orleans.

Missouri.—Three cases of yellow fever, with one death, were reported from Gregory, Mo., ten miles south of Keokuk, Iowa. The victims were Italians recently arrived from Greenwich, Miss. A spread of the disease in that section is not anticipated.——The St. Louis *Post-Dispatch* says: "Let us use the methods of science and civilization, not of ignorance and barbarism."——St. Louis will use a steamboat as a yellow fever hospital if cases occur.

Six of the Italian laborers quarantined at Gregory have escaped.——The health board of Keokuk has issued orders prohibiting trains or steamboats stopping at Keokuk.

New York.—A laborer recently returned from Panama, who was isolated in the Norwegian Hospital, Brooklyn, and reported to be suffering from yellow fever, is now declared to be suffering from tropical malarial fever, and his recovery is despaired of.——Dr. A. H. Doty on August 15 removed from the Mallory Line steamer *Concho*, from Galveston, ten persons having temperature above normal, and kept them under observation as suspects.

Oklahoma.—Guthrie decided not to quarantine, the mayor announcing his full acceptance of the results of the late Dr. Reed's work in Cuba.

Pennsylvania.—The Pennsylvania State Quarantine Board at its meeting at Marcus Hook on August 8, decided to establish quarantine against all ports south of St. Mary's, Ga., which includes all ports on coast and gulf from which an invasion of yellow fever is to be feared. It is considered that with the precautions taken at Marcus Hook, Philadelphia stands in no immediate danger of a visitation of the fever.

South Carolina.—Charleston fumigates cars, detains vessels from Central America, and requires five days' detention of persons from infected points.——The Board of Health of Columbia decided that quarantine was unnecessary.

Tennessee.—The Memphis and Shelby County Medical Society approved the quarantine as being demanded by the commercial bodies, but expressed its conviction that the disease is spread by mosquitoes.——Memphis permits through passengers to step from one train to another, but no more.——The Chattanooga quarantine is rigid and has been accompanied by various spectacular procedures. Through cars from Louisiana must have doors and windows closed and locked while passing through the city. Laundry operations have been restricted by fear of the workers getting yellow fever from Pullman car bed linen. One traveler said: "Knowing as we all do, that yellow fever is not even contagious without the mosquito inoculation, it is needless to say that Chattanooga is worth a visit just to see the fun." Another traveler wrote: "They were whirled at speed through Mississippi and Tennessee towns; there was no buffet or diner, and ice and water alike gave out. Neither conductor nor porter were permitted to leave the car at any station, and women and children were made to suffer 'sweatbox' punishment from closed sashes. In a high temperature this was often prolonged by switching off the sleeper and 'isolating' it a mile or so away, awaiting some through train to whirl the infected monster to the next insane town."—Memphis has had its quarantine troubles, and has finally ameliorated its conditions. One man secured a court injunction suspending the quarantine so far as his family was concerned.——Many trains have been annulled until travel is resumed.——It is alleged that politics played its part in the quarantine, the Board of Health being shorn of power, which was transferred to the chief of police.——Knoxville inspects all trains.——Brownsville keeps out everyone who has not a certificate from its county board of health.——Moscow ordained "that it shall be unlawful for any person to enter the corporate limits during the prevalence of yellow fever in the South."—It is said that the stegomyia abounds in Knoxville.——The Tennessee Legislature at its last session provided only a reduced epidemic fund of $5,000. Request has therefore been made of Surgeon-General Wyman to conduct train inspections with the corps of the United States Public Health and Marine-Hospital Service.——The Tennessee health authorities are endeavoring to arrange with Surgeon Young, United States Public Health and Marine-Hospital Service, and with the authorities of Mississippi and Arkansas for uniform certificates of health.——Memphis continues to kill mosquitoes and oil stagnant water.——Memphis has decided to permit passengers to transfer through the city, a detention car to be provided.

Texas.—Houston has a new mosquito ordinance, and oil has been supplied for pools, swamps, cisterns, etc.——Somerville is cleaning up and killing mosquitoes.——Jasper has a rigid quarantine.——It is proposed to inspect trains entering Texas from Indian Territory, to exclude refugees coming in by the roundabout way.——*The Texas State Journal of Medicine* scores those physicians who, disbelieving in the mosquito hypothesis, publish their dissent in the newspapers. It well says that such expressions are "pernicious, contrary to demonstrated facts, calculated to lessen medical influence, disturb public confidence, threaten commerce, and endanger human life."——As a matter of precaution the annual encampment of the Texas National Guard will not occur this year. ——The Texas Legislature provided no funds to fight disease and forbade the issuing of emergency certificates. The State Health Officer may therefore be compelled to accept public subscriptions in order to meet necessary expenses.

Virginia.—A strict quarantine against yellow fever was arranged for by the State Board of Health August 14. Correspondence from the Norfolk Board of Health was read setting forth the necessity of state action and the board determined on a vigorous method which is practically a quarantine against the infected districts. Inspectors will meet all trains at the state line and detain any suspected cases. Boats from the south will be subject to strict examination and quarantine regulations by the Norfolk authorities.

General and Foreign.

Cases to Date.—Up to the evening of August 20, 1,641 cases had been reported, with 221 deaths from 322 sub-foci of infection. On August 20, 61 new cases were reported in New Orleans and 21 outside of the city, making a total of 82, from 16 new sub-foci of infection, and 9 deaths.

Epidemic in Honduras.—It is reported that yellow fever is practically epidemic in Honduras, and that the disease appeared there simultaneously with the outbreak in New Orleans in May. It is believed that the disease was conveyed to Honduras by Italian freight handlers on the fruit steamers plying between there and New Orleans.

Panama.—Governor Magoon is supporting extraordinary efforts to perfect the proper sanitation of the Isthmus. Laborers have been withdrawn from other tasks for this purpose, and every effort is being made to assure sanitary camps, to get a good water supply into Panama, to erect hospitals, to fill in swamps and to cut down the underbrush about Colon and all the camps.

Record to August 23.—New cases outside New Orleans, August 22, 69; new deaths, 3; new cases in New Orleans, 57; new deaths, 9; new sub-foci, 21. In all 1,598 cases have been reported, with 230 deaths, a death rate of 14.4 per cent.

FOREIGN.

The Chair of Surgery in Leeds University.—Mr. Edward Ward, who has held the professorship of surgery in Leeds for the past six years, has resigned. He is to be succeeded by Mr. Harry Littlewood, M.Sc., F.R.C.S.

Cholera in Russia.—A dispatch from Europe states that cholera is still raging in several provinces on the left bank of the Vistula. The report states that the Russian censor has forbidden the publication of any details of the epidemic. Until now the frontier districts have not been affected.

International Congress of Hydrology.—The seventh meeting of the International Congress of Hydrology, Climatology,

Geology and Physical Therapeutics will be held in Venice, Oct. 10, 1905. The general secretary is Dr. Fausto Oreffice, S. Stefano 2803, to whom all communications should be addressed.

International Exhibition in New Zealand.—The government of New Zealand, it is reported, has decided to hold an international exhibition at Canterbury from November, 1906, to April, 1907. One of the principal objects of the exhibition will be to demonstrate the resources of New Zealand as a food-producing country.

Summer Diarrhea Among Children in London.—A cable report from London, dated August 19, states that every hospital for children is full and that cases of summer diarrhea are being turned away because of lack of accommodation. There is reported to be a greatly increased mortality from this disease among children under 2 years of age.

The Plague Mortality.—It is reported that the plague epidemic has perceptibly declined. The Central Provinces, Central India and Rajputana are said to be free from the disease, but this is probably doubtful. The officers investigating the disease will remain in India till October. They are now engaged in research work in Bombay.

New Public Mortuary in Hong Kong.—The new public mortuary, which was completed in the early part of the year, is equipped so that the most varied pathologic research can be undertaken. The institution includes one research laboratory for the examination of rats and other animals, two large mortuaries, and two small laboratories for research work.

Epidemic of Sore Throat in London.—It is reported that hundreds of cases of sore throat have occurred in London. The disease is said to be slightly contagious. The first symptoms are slight hardness in the throat, which by morning has developed into a stinging pain. In some cases the Eustachian tube seems to be involved as a few patients complain of partial deafness.

Swimming in the Glasgow Public Schools.—For some time the Glasgow school board has given lessons in swimming in the public schools, and it is stated that these are much appreciated. Over 90 per cent. of the boys, receiving two lessons a week, were able to swim well after eight weeks, and about 50 per cent. of those receiving one lesson a week were fairly proficient in the same time.

Malaria in Italy.—The prophylactic administration of quinin is the distinctive feature of the campaign against malaria now being pushed into the Roman Campagna, under the auspices of the Italian Red Cross Society. During the month of June it is reported that 8,021 persons were given quinin in preventive doses. There were 168 cases of malaria in the section under observation, all of which occurred among persons who refused prophylaxis or were negligent in pursuing treatment.

Pure Milk Depots in England.—In an effort to check infant mortality the municipality of Leeds has decided to establish pure milk depots where the poor can obtain clean milk. The lord mayor has started a fund for this purpose with a subscription of $1,000. A committee has been appointed, composed of medical men, and the chairman in a letter asking for subscription refers to what has been done in America in this way. The committee intends purchasing milk from farmers whose cows are free from tuberculosis. It is intended that the cows shall be milked and the milk cooled and bottled under the immediate supervision of the employés or officials of the committee.

London Coroner Advocates Day Nurseries.—Dr. Waldo, the coroner for the city of London, is quoted as saying that the high death rate among infants and young children is largely due to ignorance and to involuntary neglect. Many women who are employed during the day leave their children to be looked after by neighbors, with the result that the children are often fed milk tainted with germs from the dust and refuse in the streets. The ignorance of mothers as to the proper way of caring for a baby or of feeding it, Dr. Waldo thinks, is also a cause of the high death rate. He states that he is in favor of the establishment of crèches near all large factories and workshops, where mothers can leave children in the care of a competent attendant and have them looked after properly on payment of a small fee.

An Antimalarial League in Greece.—An antimalarial league has recently been founded in Athens under the patronage of the king. The objects of the league are to disseminate knowledge concerning the results of modern malarial research among the people; to study the distribution of malaria and its special characteristics in the various districts; to draw up maps showing the marshes in each department; to remove pools in the neighborhood of houses; to investigate the means of drying up or of purifying the marshes; the destruction of mosquitoes; the introduction of mechanical means of protection of houses, etc.; the gratuitous supply of quinin, and the drafting of a bill providing for the carrying out of these objects and its presentation to the government. Professor Hadzimichalis, president of the Superior Health Council, is president of the league.

The Mission to Lepers in the East.—During the thirty years of its existence this mission has received about $850,000. Its first asylum was built in 1875 and it has now 42 asylums of its own while it aids 16 others. It has 20 homes for the untainted children of leper parents. This separation of healthy children, says the *British Medical Journal*, is one of the most important branches of the society's work in the struggle against leprosy. In addition to India, the society is active in various centers of Burmah, Ceylon, China, Japan and Sumatra. Several asylums in India have been transferred to its care, showing that the endeavors of the mission to lepers are appreciated on the spot, so much so that it receives considerable aid from the government. The medical side of the work is kept well in view. In many places fully qualified men are in charge of the asylums; in others there are hospital assistants, or helpers, with some medical knowledge. In the East there is no doubt that western medical influence is called on to play a preponderating part in the advancement of civilization.

Longer Period of Study for Indian Medical Students.—It was proposed to increase the period of study in the Calcutta Medical School from five to six years, but after the subject was thoroughly discussed it was decided to make no change, as a certain number of native medical men, supported by a limited portion of the native press, advised students to go to Japan and study rather than to Europe or Calcutta. One reason given for this advice is the reputed cheapness of study and of living in Japan, while at the same time it is argued that the education is equally good. It is forgotten, says the *Lancet*, that students who do not possess qualifications recognized by the government naturally have to shift for themselves as best they can in various forms of private practice. That a certain section of the native press should support such a proposal is not altogether astonishing and it is taken advantage of to attempt a sort of rebuff to British and European medical pretensions. In fact, the proposal was very inadequately considered on its merits and was chiefly made use of as a political move. The *Lancet* considers it very poor patriotism on the part of the Bengali "nation" to sacrifice its medical students for the sake of a very doubtful political snub.

Leprosy in China.—The Public Health and Marine-Hospital Service calls attention to a medical report, by Dr. Georges Brarbezioux, in the publication of the Chinese Imperial Customs, in which is described a remarkable focus of leprosy existing in Yunnan, the most southwest province of China. The report states that the number of lepers is very great and that they wander in the fields and about the streets of towns, frequenting abandoned pagodas and presenting the horrible stigmata of the disease. There are in Yunnan entire villages of lepers where the inhabitants live miserably on the products of rice fields. These persons have slight relations with the outside world, though they are free from the restraint of sanitary regulations and are not by any means ostracized. Nevertheless, they seclude themselves from the society of healthy persons, mingle with lepers only, and do not visit other villages except when the gravity of their disease renders labor impossible. When broken down physically by the progress of the disease they join themselves to more prosperous and healthy communities, and thus swell the immense army that lives in such places by public charity. With the advent of white men in Yunnan the number of leprous beggars has notably increased. It is estimated that in Yunnan there is one leper for every 100 inhabitants, but the concentration in certain parts of the country is still greater than the general figures indicate. There are no institutions, public or private, for the care of these unfortunates, and the disease is not considered to be more than very slightly, if at all, contagious.

LONDON LETTER.

Goats and Malta Fever.

An important discovery seems to have been made with regard to the propagation of Malta fever. About twelve months ago a commission was appointed by the admiralty, the war office and the civil government of Malta for the pur-

pose of inquiring into the prevalence of Malta or Mediterranean fever among the naval and military forces and the general population of Malta. The commission originated in a letter sent by the colonial secretary to the Royal Society in which he drew attention to the prevalence of the fever and invited the society to nominate a commission of investigation. This was done, and Colonel Bruce of the army medical department (who in 1887 discovered the microbe of Malta fever, the *Micrococcus melitensis*), was appointed chairman. For some time the committee has been engaged in pathologic investigations of an extended character. A series of epidemologic inquiries were conducted in the Maltese Islands by Dr. R. W. Johnstone, one of the medical inspectors of the local government board. Then attention was directed to the milk supply. In Malta the usual source of milk is the goat, flocks of which are driven about the streets to be milked at customers' doors. Two members of the commission, Dr. Zammit and Major Horrocks, have determined experimentally that goats are susceptible to Malta fever. Hence they infer that the disease may be spread to man by the medium of milk. Numerous tests showed that some of the goats in every herd examined were suffering from Malta fever, and that the micrococcus is excreted in the milk in enormous numbers when the disease has existed long enough to bring about a change in the physical character of the fluid.

The King's Hospital Fund: Permanent Income of $250,000 Secured.

The King's Hospital Fund was founded in 1897 by his majesty when Prince of Wales, who saw in the scheme a striking way of commemorating the sixtieth year of the reign of the late queen. In the first eleven months of its existence $1,100,000 was paid into the fund, and this has been increased each year until at the end of 1903 the total amounted to $5,500,000. The awards paid to the various London hospitals have amounted to $2,500,000, and more than $3,300,000 has been invested. As the result of some recent gifts and bequests the fund has now reached such a capital amount that a permanent income of $250,000 is secured—the object at which the trustees have been aiming for some time. All the hospitals within a radius of seven miles from Charing Cross or within the area of London County Council are entitled to share in the benefits of the fund, which since its foundation has been instrumental in opening no fewer than 443 free beds.

The Government and Industrial Mercurial Poisoning.

The government has issued a memorandum reminding medical practitioners that they must notify the chief inspector of factories of every case of mercurial poisoning contracted in a factory or workshop. Proper notification forms for this, as also for anthrax, for poisoning by lead, phosphorus or arsenic are supplied. Factory surgeons are obliged to investigate and to report on all cases of mercurial poisoning brought to their knowledge, and in certifying children and young persons for employment in industries in which mercury is used they are reminded of the undesirability of young persons being employed in mercurial processes, not because they are more susceptible to the poison, but because of their probable inattention to the necessary precautions. Fifty-six cases of mercurial poisoning were reported between May, 1899, and Dec. 31, 1904. They occurred in the following industries: Manufacture of thermometers, 15; electric meters, 15; hatters, furriers, 10; chemical works, 7; water gilding, 5; powder factories, 3; photoengraving, 1. Factory surgeons have power at their periodical medical examinations to suspend not only workers showing signs of poisoning, but those who, by inferior physique, indulgence in alcohol, careless habits and want of attention to the regulations, show a liability to mercurial intoxication.

The Quatercentenary of the Royal College of Surgeons of Edinburgh.

With fitting pomp the Royal College of Surgeons of Edinburgh has celebrated its quatercentenary. The celebration began by a service in St. Gile's Cathedral, which was attended by a large and brilliant gathering. The honorary fellows-elect, who included distinguished surgeons from all parts of the world, among whom were the American professors Halsted, Keen and Howard Kelly, the fellows and a representative company of guests marched in procession to the cathedral. The commemoration ceremony was held in the afternoon and was attended by representatives of other colleges, of various universities and of learned bodies. Sir Patrick Heron Watson, the president, delivered a short address of welcome in which he sketched the history of the college. Its origin as a corporate body may be traced to the reign of James IV of Scotland, who in 1506 confirmed the royal charter which a year previously had been granted to the barber-surgeons resident within the borough of Edinburgh by the provost, bailies and council of the borough. There is reason to suppose, however, that previously an organized body of practitioners existed to whose desire for authority to practice the college is indebted for its inception. The honorary fellowship was then conferred on a number of distinguished foreign and British surgeons. A banquet was held at which 350 were present. The president was accompanied by the lord provost of Edinburgh, the French ambassador and other prominent officials and distinguished guests.

"Costly Medical Errors."

Under this and similar titles the lay press waxes very indignant at errors in diagnosis made by physicians who have sent patients to the London fever hospitals. It appears that during 1904, 21,000 cases of scarlatina and 538 cases of smallpox were admitted to these hospitals, and that also nearly 2,000 cases of mistaken diagnosis occurred. The average period of detention in these latter cases was a little over three weeks and the expenditure represented $60,000. The chairman of the statistical committee of the hospitals said that this expenditure ought never to have been incurred and that these patients should never have been sent to hospital. How infallibility of diagnosis is to be secured he did not explain.

The Proposed Amalgamation of the London Medical Societies.

The executive committee of representatives of the London medical societies, appointed to consider a scheme of amalgamation, as mentioned in THE JOURNAL, May 6, 1905, page 1461, has presented a report. The committee appointed chartered accountants to investigate the rolls of membership and the accounts of the principal 22 London societies. These were found to have a membership of 7,229, composed of 4,997 persons. Of these 3,725 are members of only one society and the remaining 1,272 are members of more than one society. The balance of assets over liabilities (including certain bequests and trust funds) is more than $200,000. If 3,800 members of societies other than the Royal Medical and Chirurgical Society become members ata subscription of $5 per annum the new society will have a small balance of income over expenditure. If any members of these societies become fellows at a subscription of $15 the balance will be increased. This estimate is based on the present income and expenditure of the Royal Medical and Chirurgical Society and the income and expenditure of 17 other societies, and makes no allowance for any economies which may be effected by the union. The present income of the Royal Medical and Chirurgical Society is $25,000; its expenditure is $21,500. In view of the facts that 3,525 persons already subscribe $5 each to the other societies and that 1,272 pay from $10 upward, it is thought that the new society will have a sufficient balance of income over expenditure to provide for improvements and for any sinking fund rendered necessary by extensions of the premises of the Royal Medical and Chirurgical Society. The committee made the following suggestions: 1. The new society shall be called the Royal Society of Medicine, or the Royal Academy of Medicine, according to the vote of the societies concerned. 2. It shall be housed at 20 Hanover Square, the present premises of the Royal Medical and Chirurgical Society. Increased accommodation can be obtained by extending the premises and by the absorption of certain rooms now occupied by tenants. 3. The society shall meet four or more times annually to discuss subjects of medical and scientific interest. 4. The society shall consist of the following sections, with power to add new sections or to modify the existing ones: 1, Anesthetic; 2, clinical; 3, dermatologic; 4, diseases of children; 5, epidemiologic; 6 laryngologic, otologic and rhinologic; 7, medical; 8, mental medicine (psychiatry); 9, neurologic; 10, obstetric and gynecologic; 11, odontologic; 12, ophthalmologic; 13, pathologic; 14, state medicine; 15, surgical; 16, therapeutic, including general therapeutics, pharmacology, electrotherapeutics, balneology and climatology. It is hoped that in the early future an anatomic and physiologic section will be formed. 5. The society shall consist of fellows, members, honorary fellows and honorary members. The fellowship shall be restricted to those practitioners whose scientific attainments are satisfactory to the general council. 7. A fellow shall pay annually $15 and shall have the right to attend all meetings of the society or any of its sections, and shall have the full use of the library. 8. Each section shall have power to elect as members of the society such persons as the council of the section shall think fit, provided that the names be previously submitted to the council of the society for approval. 9. A member of any par-

ticular section shall pay annually $5 and shall have the right to attend all the meetings of his section, but must pay an additional $1 annually if he wishes to use the library, and a further subscription of $2.50 for each additional section. 10. The general management of the society shall be under the control of a general council consisting of the president, the presidents of the various sections, two treasurers, two librarians, two secretaries and eight other fellows. 11. A monthly publication shall be issued except in the months of July, August and September, and be called "The Proceedings of the Royal Society of Medicine." It will be under the control of an editorial committee and will contain a record of the work of each section during the previous month. In addition the committee will select, subject to the approval of the general council, such papers as they may consider worthy of publication in the transactions of the society. The committee further suggested that it would be an advantage to form a committee of representatives of the various sections to receive all papers to be read. This committee would have power to decide before which section a paper should be read and whether other sections of the society be asked to join in the discussion. The committee concludes that the union of the medical societies will do much to enhance the prestige of British medicine and to increase the value of the work carried on by the existing societies, and that it will be a great convenience to the profession.

The Increase of Suicide.

At the Medicolegal Society Dr. Wynn Westcott, coroner for Northeast London, read an important paper on suicide. He found that inquest juries bring in only about 1 per cent. of suicides as guilty of *felo de se;* in cases where there is no evidence of the mental condition of the person they attribute the act to temporary insanity. He said that patients are often prematurely discharged from asylums and in the exigencies of home life slay themselves. Of predisposing causes alcoholism is the most common, then the presence of disease. An additional grievance or an overmastering passion, he stated, is usually the proximate cause. The relation of the sexes is very constant—three men to one woman. The rate of suicide per million of the population is constantly increasing; thus in 1861 it was 66; in 1881, 77; in 1891, 85; in 1901, 96, and in 1903, 105.

Correspondence

The Yellow Fever Epidemic.

NATCHEZ, MISS., Aug. 15, 1905.

To the Editor:—IN THE JOURNAL, August 12, you did a palpable injustice to some of the best people in the South when you refer to the quarantines as relics of the middle ages. Please let me call your attention to the report of the president of the Louisiana State Board of Health, in which he admits that he was aware of the existence of the fever on the 13th, but waited eight days before admitting it, thus allowing the people from the infected area time to scatter all over the states of Alabama, Mississippi and Louisiana. It is this continued failure to keep faith with the people that has forced the present harsh measures. We know that non-intercourse with infected areas will prevent the introduction of the disease into the healthy towns, and propose to follow up the plan that has proved safe in other times. We have had two small epidemics here; in both cases the infection was brought here when there were no reported cases in New Orleans. We lost some of our best people each time, and the fever spread in spite of every known method of checking its progress.

I have had considerable experience in the treatment of the fever though not an immune, and I may tell you that I am unable to prevent the mosquitoes biting either myself or the patients. My own house is screened throughout with the finest of wire screens, and each bed has the very best mosquito netting, yet in spite of all these precautions we have to endure the annoyance and stings of these pests. All southern people know these things, and for this reason they seriously doubt the possibility of checking the spread of the infection by means of screens. They know the practical impossibility of preventing the patient being bitten.

As to the quarantines: We do not enjoy them at all ourselves. They almost destroy trade and prevent business of all kinds. But we can not help ourselves. We do not know where the infection has spread, so a policy of exclusion is being practiced. We harm no one; simply say to them, "For the present please stay at home." If you will come here and visit us, and let us show you our death records, we are sure that you would favor anything that gave promise of safety from this pestilence.

It may be that some reporter allowed his imagiantion to run away with his regard for the truth, and to that report you referred. But to my mind, the people have acted with great forbearance, considering the vast amount they had at stake. We do all in our power to render the six days' detention as pleasant as possible to all concerned. But this city is certainly closed to the world for the present. If it were not so, persons leaving New Orleans could go direct to Chicago, procure a health certificate, and be here in less than three days.

I trust that you will publish this little note, and you can refer to the issue of THE JOURNAL for August 12 for the report of Dr. Souchon to which reference is made.

J. C. BALLARD, M.D.

An Indorsement of Governor Pennypacker by Philippine Islands Medical Association.

MANILA, P. I., July 12, 1905.

To the Editor:—By direction of the Committee on Public Policy and Legislation of the Philippine Islands Medical Association, I have the honor to forward a copy of a resolution tendering a vote of thanks to Governor Pennypacker of Pennsylvania for the service which he has rendered the medical profession of the world and the people of his state in withholding his signature from the bill passed by the legislature to legalize and regulate the practice of osteopathy in Pennsylvania.

Governor Pennypacker has evidently given the subject of class legislation more study than is usually bestowed on it by chief executives, as is shown by his clear understanding of those principles of ethics and justice for which the medical profession has always stood.

He could have rendered his people no greater service than that which has been accomplished by his veto which may truly be called "A veto for the protection of the people of Pennsylvania from the evils of legalized quackery."

Very respectfully,

R. E. L. NEWBERNE,
Secretary-Treasurer, Philippine Islands Medical Association.

RESOLUTIONS.

WHEREAS, It having come to the knowledge of the Committee on Public Policy and Legislation of the Philippine Islands Medical Association, through the editorial pages of THE JOURNAL of the American Medical Association, that Governor Pennypacker of Pennsylvania has vetoed the bill passed by the legislature to legalize and regulate the practice of osteopathy in that state; and

WHEREAS, The reasons given by the governor for his course are so manifestly just and fair, it was, on motion,

Resolved, That the Committee on Public Policy and Legislation of the Philippine Islands Medical Association tender a vote of thanks to the governor of the commonwealth of Pennsylvania for the careful study which he has given this objectionable bill, and for the just, courageous and scholarly stand which he has taken in the interest of science and justice, and for the protection of the people against the evils of class legislation. It was further

Resolved, That the secretary of the committee be instructed to forward copies of the resolution of the committee to Governor Pennypacker and to THE JOURNAL of the American Medical Association.

Finsen's Light Institute.

COPENHAGEN, July 11, 1905.

To the Editor:—After a week spent at Finsen's Light Institute I have begun to realize the magnitude and extent of the work performed here. Each day from 150 to 200 patients receive treatment, among whom one can recognize types from all civilized nations. The institute itself is situated in a quiet part of Copenhagen, the streets leading thereto being amply provided with shade trees which produce a pleasing and restful effect as one approaches the buildings. The institute physicians, four in number, are well trained and courteous. The government annually subscribes 30,000 kroner toward the maintenance of the institution. This, together with the Nobel prize money which Finsen munificently tendered the institute, has rendered possible its present complete organization.

All who seek treatment obtain it. Those who can afford to pay do so, and those who can not afford to pay receive

treatment gratis. A school is also maintained for the children who are compelled to undergo treatment for a long time. Much compassion is shown the poor unfortunates who come disfigured with disease, and they are treated most kindly by physicians and nurses alike. From 8 to 11 a. m. every day the physicians are at work in their large, well-lighted clinic room, examining new patients and treating by topical applications and the galvanic cautery such lesions of the nasal and oval cavities as are inaccessible to the lamp treatment. In this room the doctors indicate with pencil by marking circles around the various lesions which are to be exposed to the chemical light rays that day. Thus is the progress of each patient watched and directed daily.

From the clinic the patient is conducted to the laboratory for light treatment. Here are eight large 50-ampere arc lamps, each lamp being equipped with four projectors containing lenses and cooling devices to accommodate four patients. Thus 32 patients can be treated at one time, each patient being under the immediate care of a separate nurse who applies the light. Several other lamps are placed in smaller rooms where more privacy is obtained. The current supplied by the city is 500 volts direct. This being too high for safety, is used to actuate a motor which in turn drives a dynamo that delivers a 70-volt direct current. This current supplies the energy for all the apparatus.

With the patient placed on the table, the area which has been pencil-marked by the physician is brought to focus under the light, and with a compressor lens over the lesion, is exposed for one hour and ten minutes. In twenty-four hours a strong reaction is visible where the light has acted, vesicles form which take from six to ten days to heal up. If this exposure has not been sufficiently strong to destroy the active lesion another is given, and so on, one treatment every eight or ten days until the disease is vanquished. If the disease is extensive different regions are exposed daily.

The conditions which yield best to the light treatment are lupus vulgaris and erythematosis, acne, small non-elevated angiomata or port-wine marks, and very superficial epithelioma. For these diseases and conditions the chemical light treatment as carried out here is as near specific as anything medical or surgical can be within the meaning of that word. For ordinary or deep-seated epithelioma the Roentgen rays are used. For this purpose a 20-inch Rumkorrf induction coil is provided, with mercury turbine interruptor on the 70-volt direct current. Twenty-minute exposures are made and repeated when reaction permits. Patients suffering from lupus erythematosis are given in addition to light treatment from 20 to 30 centigrams of quinin daily.

The results obtained here can be ascribed to efficient apparatus, and, more important yet, correct technic and patience. The rooms of the institute are open to the physicians of the world, who can see for themselves and judge; nothing is kept hidden. The management of Finsen's Institute desire to have it known that they have no connection whatsoever with a so-called Finsen Institute of America, located, I believe, in Chicago and widely advertised in the daily press.

ALBERT SOILAND, M.D. (Los Angeles).

Marriages

WILLIAM G. DOERN, M.D., to Miss Reeves, both of Fort Madison, Iowa, August 15.

WALTER F. MCCABE, M.D., to Miss Anna M. Moe, both of Beloit, Wis., August 12.

THOMAS GARTON KELL, M.D., Pineville, N. C., to Miss Marie Laura Delmas of Pascagoula, Miss., August 9.

REGINALD M. BURDON, M.D., Green Bay, Wis., to Miss Louise Lange of Houghton, Mich., August 16.

LOUIS F. BAKER, M.D., to Mrs. Nellie S. Appleby, both of Fitchburg, Mass., in New York City, August 11.

DAVID JAMES GRAHAM, M.D., Edinburgh, Scotland, to Miss Ethyl Gray of San Francisco, in New York City, August 9.

GEORGE J. KOCH, M.D., to Miss Josephine Fitzmaurice, August 9.

FRANCIS E. KING, M.D., to Miss Mary Owens Randall, at Baltimore, August 14.

TRESTON R. AYARS, M.D., to Mrs. Fannie Hamilton Shedd, both of St. Louis, August 16.

CHARLES L. LARGE, M.D., Forest Grove, Ore., to Miss Edna L. Hicks of Fairmount, Minn.

DEACON STEINMETZ, M.D., to Mrs. Ellen Fagan Crosby, both of Philadelphia, August 14.

FRANK DYER SANGER, M.D., Baltimore, to Miss Grace Hamilton Hague Cochran, August 9.

GEORGE H. EHRHORN, M.D., Tea, S. D., to Mrs. Florrie B. Dales, at Anniston, Ala., August 3.

ROBERT LEE SCHORR, M.D., to Miss Mabell Stanley Leonard, both of Detroit, Mich., August 23.

HARRY C. PARKER, M.D., Boston, to Miss Clara Margaret Parker of La Grange, Ill., August 16.

WILLIAM C. ARONS, M.D., Hudson, Wis., to Miss Mary C. MacMurdy of Aitkin, Minn., August 4.

GEORGE M. LIVINGSTON, M.D., Manistique, Mich., to Miss Mabel A. Joy of Albion, Mich., June 28.

MARCUS HAROLD MERCHANT, M.D., to Miss Alice Louise Gardner, both of Warren, R. I., August 14.

CHARLES WALLACE RANSOM, M.D., Brooklyn, Wis., to Miss Myrtle B. Richards of Beloit, Wis., June 14.

HARRY HAMILTON SNIVELY, M.D., Columbus, Ohio, to Miss Florence Knowlton of Plymouth, Ohio, August 15.

HARLEY SYLVESTER HERRICK, M.D., Westford, Vt., to Miss Florence Amelia Holyoke of St. Albans, Vt., August 2.

LILLIAN B. ESHLEMAN, M.D., Battle Creek, Mich., and Prof. Percy Taylor Magan of Unavara, Madison, Tenn., at Cherokee, Iowa, August 23.

Deaths

Samuel Wilson Trimmer, M.D. Philadelphia College of Medicine and Surgery, 1854, a prominent physician and politician of Luzerne County, Pa., some-time prothonotary and oil inspector of the county; a member of the National Association of Railway Surgeons, Luzerne County Medical Society and Lehigh Valley Medical Society, died at his home in White Haven, July 31, from angina pectoris, after an illness of several weeks, aged 71.

Clarkson C. Schuyler, M.D. Albany (N. Y.) Medical College, 1875, member of the Clinton County Medical Society, for 14 years consulting surgeon to the Troy Hospital, member of the Association of Military Surgeons of the United States, and state forest commissioner from 1893 to 1895, died from cirrhosis of the liver at his home in Plattsburgh, N. Y., August 16, aged 55.

John H. Stringfellow, M.D. Department of Medicine of the University of Pennsylvania, Philadelphia, 1845, known as the father of Atchison, Kan., speaker of the first Kansas House of Representatives, and founder of the *Squatter Sovereign*, the first newspaper published in that state, died at his home in St. Joseph, Mo., July 29, from pneumonia, aged 86.

Henry D. Stauf, M.D. Missouri Medical College, St. Louis, 1885, of St. Louis, who wandered away from home when ill July 28, is supposed to have fallen into the Mississippi River and been drowned on that day, aged 42. His body was taken from the river at Barrow, Tenn., August 12.

Robert Marsena Stone, M.D. New York, 1874; St. Louis College of Physicians and Surgeons, 1884; a member of the American Medical Association; a prominent practitioner of Omaha, who had made a special study of anesthesia for many years, died at his home in Omaha, August 14, from nephritis, after an illness of several weeks, aged 58.

Otto Negelspach, M.D. University of Michigan Department of Medicine and Surgery, Ann Arbor, 1887, was killed instantly at his home in Millersburg, Ohio, August 14, by touching a broken telephone wire which had crossed an electric light wire, aged 37.

Andrew Carr Kemper, M.D. University of Louisville Medical Department, 1866, who served throughout the Civil War as surgeon, for the most part on the staff of General Halleck, died at his home in Cincinnati, August 15, aged 73.

W. Dalton Deshazo, M.D. University College of Medicine, Richmond, Va., 1905, of Stokesdale, N. C., died at the home of J. P. McMichael, near Madison, N. C., August 11, from typhoid fever, after an illness of three weeks, aged 24.

Samuel D. Tracy, M.D. Barnes Medical College, St. Louis, 1899, of Odin, Ill., president of the Southern Illinois Medical Association, died at the Olney Hospital, August 11, from typhoid fever, after a lingering illness, aged 29.

Robert Hugh Cooke, M.D. Starling Medical College, Columbus, Ohio, 1858, a surgeon in the Army during the Civil War, who retired from practice in 1866, died at his home in Grayville, August 6, after a long illness, aged 73.

John Van Vliet, M.D. Ensworth Medical College, St. Joseph, Mo., 1880, died at his home in Wheaton, Kan., August 7, from the effects of carbolic acid self-administered while despondent over long-continued ill health, aged 52.

J. L. Thigpen, M.D. Medical Department of the University of Georgia, Augusta, 1881, died at his home near Pineview, Ga., August 4, after a period of invalidism, due to cerebral hemorrhage, of four or five years, aged 68.

Francis Marion Setzler, M.D. Medical College of the State of South Carolina, Charleston, 1862, died at his home, near Whitmire, S. C., July 29, from disease of the stomach, after an illness of six months, aged 60.

W. S. Duncan, M.D. Illinois Army Board, 1864, (Years of Practice, Illinois), 1884; assistant surgeon Tenth Illinois Volunteer Cavalry in the Civil War, died at his home in Greenup, Ill., August 2, aged 80.

E. R. Weaver, M.D. Tennessee Medical College, Knoxville, 1892, of Highland Park, Chattanooga, Tenn., died at Erlanger Hospital in that city, August 4, after an illness of five weeks, aged 45.

Kimball David Webster, M.D. Vermont Medical College, Woodstock, 1837, said to have been the oldest practitioner in New Hampshire, died at his home in Gilsum, N. H., August 9, aged 94.

Harriman Couch, M.D. (Years of Practice, Illinois), 1879, said to have been the oldest practitioner of Peoria, Ill., died at St. Francis' Hospital in that city, August 18, after a long illness.

Frederick C. Hall, M.D. Medico-Chirurgical College of Philadelphia, 1894, died at his home in Scranton, Pa., August 14, from septicemia contracted in an operation six years before.

Joseph D. Wade, M.D. Medical College of the State of South Carolina, Charleston, 1857, died at his home in Marshallville, Ga., August 2, after a long period of decline, aged 72.

John H. King, M.D. University of Maryland School of Medicine, Baltimore, 1872, of Pocomoke City, Md., died at Ocean City, Md., August 12, from heart disease, aged 47.

Robert Patterson Robins, M.D. Department of Medicine of the University of Pennsylvania, Philadelphia, 1880, of Philadelphia, died at Sharon, Conn., August 13.

Wilfred J. Labelle, M.D. Laval University Medical Department, Quebec, 1895, died suddenly at his home in Swanton, Vt., August 9, from heart disease, aged 33.

John W. Holloway, M.D. University of Louisville Medical Department, 1850, died at his home in Nicholasville, Ky., from senile debility, August 14, aged 82.

Robert J. Clark, M.D. Department of Medicine of the University of Pennsylvania, Philadelphia, 1868, died at his home at Chestnut Level, Pa., August 19.

Nathan M. Scales, M.D. Department of Medicine of the University of Pennsylvania, Philadelphia, 1860, died at his home at Vose, Ky., August 18, aged 67.

Cornelius C. V. Crawford, M.D. Jefferson Medical College, Philadelphia, 1863, of Camp Ground, Pa., died at Atlantic City, N. J., August 16.

D. H. Patchen, M.D. Illinois, 1879, of Fremont, Ind., was found dead in a hotel at Walcott, August 10. The coroner's verdict was suicide.

Samuel Sherbourne, M.D. Long Island College Hospital, Brooklyn, N. Y., 1882, died at his home in Philadelphia, August 14, aged 71.

James A. Murray, M.D. Chattanooga (Tenn.) Medical College, 1894, died at his home in Glenalice, Tenn., August 9, from pneumonia.

George E. Smith, M.D. Medical College of Ohio, Cincinnati, 1862, died at his home in Oberlin, Ohio, August 3.

Samuel J. Brown, M.D. Missouri, 1896, died at his home in Beaumont Station, Mo., August 14, aged 39.

Rudolf Beetle, M.D. Albany (N. Y.) Medical College, 1888, died at his home in Hunter, N. Y., August 9.

I. C. Truett, M.D. (Certificate, Tennessee), 1896, died at his home in Livingston, Tenn., July 29.

Book Notices

TREATISE ON PLAGUE, Dealing with the Historical, Epidemiological, Clinical, Therapeutic and Preventive Aspects of the Disease. By W. J. Simpson, M.D. Cloth. Pp. 466. Price, $5.00. Cambridge: The University Press. 1905.

The contents of the book are divided into four principal parts: history and distribution of plague; epidemiology of plague; plague in the individual; measures for prevention and suppression of plague. There are two appendices, one giving the deaths from plague in India in 1904 and one giving the provisions of the International Sanitary Convention at Paris, 1903. There are maps, charts and illustrations of buboes, etc. "Few thought it possible, when plague broke out in Bombay in 1896 after an absence of 200 years, that the disease would not be controlled, checked and stamped out in a short time. It was a rude awakening when deaths began to mount up to a few thousand to find old scenes associated with plague epidemics reappear. The closed houses, the deserted streets, and nearly half of the population fleeing panic-stricken from the city, testified to the fact that plague had lost none of its old horrors. . . . The next year and every year since 1896, the disease has recrudesced in Bombay, and the number of deaths is fast mounting up beyond the mortality of any epidemics of plague in any single city in the past with the exception of those of Constantinople and Grand Cairo. And still the disease continues. Plague has moreover spread from Bombay to the Bombay Presidency, and from the Bombay Presidency to a large portion of India. Slow in its progress it has steadily advanced; and now the 30,000 deaths from plague which occurred in India in the past year, and which created so much alarm, has reached during the past two years over three-quarters of a million per annum. In 1903 the number of deaths from plague in India was 853,000, and in 1904 it was over a million, being 1,040,429. . . . The total number of deaths in India officially recorded from plague since 1896 was, up to the end of December, 1904, 3,150,000." Do not these statements from the preface come as a shock to most of us? The book is written with the organization of a high grade Indian public health service in mind, which is regarded as essential for the establishment of proper and effective preventive measures. At the same time plague in its various aspects is considered in such a way as to interest and greatly instruct all that are in any way concerned about this disease. The importance from the point of view of a prevention of conjoint action on the part of those engaged in research and of those engaged in administration is clearly recognized and stated. In the seventh century two kings of Erin summoned a council at Temora because the land was not sufficient to support the population. The chiefs decreed that a fast should be observed so that they might with one accord solicit God to remove by some species of pestilence the burthensome multitudes of the inferior people. And a pestilence did come; it removed the authors of the petition, the two kings and a third of the nobles concerned. This sounds passing strange to us at this time, but there are those even now who hold that plagues are necessary to keep down populations that otherwise would perish by hunger. This doctrine is easy-going and would lead to the saving of much trouble; for to prevent the spread of plague in India demands strenuous statesmanship as well as organized sanitary service. In the meantime the condition of the people of India in the worse affected provinces is most deplorable. "It not only claims the deepest sympathy, but also in the interests of humanity imperatively demands the closest attention. . . ." Dr. Simpson's book does not appear to be the product of an alarmist, but of an earnest, practical sanitarian, with broad views, and his treatise should be in the library of all students of preventive medicine.

ACUTE CONTAGIOUS DISEASES. By William M. Welch and Jay F. Schamberg, M.D. Illustrated with 109 Engravings and 61 Full-Page Plates. Cloth. Pp. 781. Price, $5.00. Philadelphia: Lea Bros. & Co. 1905.

This book deals with vaccinia, smallpox, chickenpox, scarlet fever, measles, typhus fever, diphtheria and disinfection, i. e., the diseases that by virtue of extreme contagiousness require isolation and treatment in special hospitals. Nearly one-half of the 781 pages are given over to the discussion of smallpox

and allied subjects, e. g., vaccinia and varioloid diseases in lower animals. Vaccination in all its phases is considered with great thoroughness. Dr. Welch's long personal experience with smallpox is drawn on freely and instructively, and nothing but satisfaction can be expressed with the presentation of the various topics regarding it. Our knowledge concerning this disease is here summarized in an attractive and serviceable manner and with interesting references here and elsewhere as well to the other literature on the subjects discussed. We believe, however, that the authors are a little prematurely skeptical concerning the value of the red-light treatment of smallpox advocated by Finsen. The necessity of actually demonstrating that the actinic rays are excluded completely in so-called red-light wards before any opinion may be formed as to the value of the treatment is not emphasized; furthermore, nothing is said of the limitations of the treatment outlined by Finsen, namely, that it must be begun before the fourth or fifth day of the disease.

Scarlet fever is given adequate consideration. No definite stand is taken as to the vexed question of the etiology of this disease. Most of the advocates of the streptococcal nature of the disease are cited, with some notable omissions (Moser and others). The views as to the value of antistreptococcus serum in the treatment appear conservatively sane. The extensive literature in regard to scarlet fever has been reviewed with great care. About 90 pages are given to the treatment of diphtheria. The antidiphtheric serum is given first place and a large amount of statistics bearing on the results are presented. The last chapter deals with disinfection. The illustrations are mostly of the various eruptions and rashes of the contagious disease. In the index we note that the names of the authors quoted in the text are omitted. The reviewer believes that it is of advantage in works of this nature to index the names of authors. The book is recommended heartily to physicians for guidance and information with respect to the important diseases of which it treats.

A MANUAL OF MIDWIFERY FOR STUDENTS AND PRACTITIONERS. By H. Jellett, B.A., M.D., F.R.C.P.I., L.M., with the assistance in special subjects of W. R. Dawson, M.D., F.R.C.P.I., Medical Superintendent Farnham House, Dublin; H. C. Drury, M.D., F.R.C.P.I., Physician to Sir Patrick Dun's Hospital, Dublin; T. G. Moorhead, M.D., Physician to the Royal City of Dublin Hospital, Dublin; R. J. Rowlette, M.D., Pathologist to the Rotunda Hospital and to Dr. Stevens' Hospital, Dublin. With 476 Illustrations. Cloth. Pp. 1158. Price, $5.50. New York: William Wood & Co.

In times past it was the popular belief that all things British gave evidence of their insular opinions. The work of Henry Jellett, of Dublin, would most emphatically refute any such opinion, if held. A perusal of his manual of obstetrics will impress all with the cosmopolitan character of the presentation of the material embodied in the volume. We may say with positiveness that no British obstetric writer has so broadly interpreted the work of the foreign authorities as has Dr. Jellett; the recognition of American writers is particularly frequent. From first to last one finds constant pleasure in reading the various topics. The style is easy, entertaining, and the writer has not entered into pedantic discussions; the matter is sufficiently concise for students, yet amply broad for the practitioner; the work has been so brought up to date that the latter will find much to attract him, while the former will receive a thorough foundation in the principles and practice of obstetrics. To cover the innumerable virtues of the book would necessitate a mention of nearly every topic discussed. The parts of the volume which deserve special commendation, if they may be given a preference, are the physiology of pregnancy, labor and the puerperium, and the consideration of chorio-epithelioma in the pathology of pregnancy. Special mention must be made of the obstetric operations, the presentation of which is eminently fair, free of all dogmatism of statement, and abundantly adequate for the needs of those for whom the manual is primarily intended. Certain aspects of the volume appear faulty to an American. We can not agree with Dr. Jellett in his recommendation of the Dublin method of conducting the third stage of labor if he has correctly described it; the technic of the Dublin method is not that of Credé; therefore, we can not accord priority to the rotunda for the proper technic of fundal placental expression, for Credé has suggested a material improvement. Dr. Jellett describes the Dublin method as follows: The ulnar surface of the hand should be placed behind the uterus, and expression be consummated by a downward and backward movement as the uterus is compressed from side to side. We believe this is dangerous teaching for two reasons: First, the "side-to-side" compression means the production of an actual cavity within the uterus, which does not physiologically exist, with the possibility of causing an aspiration of air—a danger which he himself mentions in the discussion; secondly, the more valid objection lies in the fact that lateral compression may produce a dangerous injury to the tubes and ovaries. We believe traction on the cord deserves no mention in a modern obstetric work as a means of delivering the placenta beyond a most unequivocal condemnation. We regret the omission of all mention of the disposal of the pubic hair in his discussions of surgical cleanliness; to say the least it is inconsistent to demand the routine shaving in gynecologic work and to omit its mention in connection with obstetric surgery. In the discussion of the treatment of eclampsia we feel that too great stress is laid on the administration of sedatives and emptying the uterus without a direct correlation of the eliminative treatment. The exhibition of chloral, bromids, morphia, and chloroform are not curative measures, are merely empirically applied expedients. Elimination is the *sine qua non* and should be most prominently brought forward in connection with all other therapeutic measures until we have a specific therapeusis. The treatment of asphyxia neonatorum is insufficiently stated, being practically limited to Schultze's swinging and Hall's maneuver, two methods formerly much in vogue, and the former still recommended with unvarying regularity. The dangers of Schultze's swinging—the rapid cooling of the body (retention of heat being a most essential requisite), the great danger of producing fractures, if not mortal injuries, the liability of causing aspiration of mucus, and, finally, the necessity of violent exertions on the part of the manipulator, leave little to recommend the procedure. We find no mention of Byrd's, Bruist's, Prochownik's, Laborde's methods, and the most convenient plan of rhythmic compression of the chest while the trunk of the child is submerged in a warm bath. The illustrations generally depict the descriptions of the text and are well executed; they truly illustrate the work.

MULTIPLE PERSONALITY, an Experimental Investigation into the Nature of Human Individuality. By Boris Sidis, M.A., Ph.D. (Harvard), Author of the Psychology of Suggestion and Psychopathologic Researches, and Simon P. Goodhart, Ph.B. (Yale), M.D. Cloth. Pp. 456. Price, $2.50 net. New York: D. Appleton & Co. 1905.

This work is in three parts. In the first, by Dr. Sidis, the subject of personality is treated, the author going through the various types of life to illustrate the development of the individual consciousness. This, of course, is largely psychologic, the view being held that as the organizations pass upward on the scale they become more complex and the possibilities of dissociation more numerous. The constitution of the individual mind, according to the author, is made up of many subordinate individual minds less complex in their nature. There may be, he says, "as many different personalities, parasitic or secondary, as there are possible combinations and disaggregations of psychophysiological aggregates. There may, therefore, be different forms of secondary consciousness or of multiple personality. These may be of a simultaneous character or one of alternation. The personalities may appear side by side or they may appear alternately. The play of personality may be of a dramatic character, the characters and personality appearing on the scene of consciousness like so many actors, the whole appearing as a play of many different persons." In other words, passing upward from the simplest individual consciousness of the lowest organism with a neuron the author finds the highest complications of neurons still a bundle of disagreeable consciousnesses or personalities. Thus in certain conditions and in certain peculiarly constituted individuals, the whole higher system of cells and association fibers may be switched off from its normal psychologic functioning corresponding to its past life and experience into something quite different so far as the consciousness or sense of identity of the individual is concerned. Recollections may be suppressed, new combinations

of the highest association centers be brought into play and a complete break in the individual life be accomplished more or less completely or permanently. This is, perhaps, not an adequate explanation of the author's ideas, but it comes as near to it as is possible without going very much more extensively into their interpretation. The second part of the book, by Drs. Sidis and Goodhart, gives their observations of the case of the Rev. Mr. Hanna, which was carefully studied by them several years ago. It is an interesting account and probably the most thorough study of any such instance that has ever been made, but it does not seem to our mind to be altogether the best one to illustrate some of the phases of so-called multiple personality. The third part, by Dr. Sidis, is entitled "Consciousness and Multiple Personality," and goes at length into the pathologic psychology of the morbid conditions here discussed. The reader will find this part of the work interesting and suggestive in many ways, and the explanations given are, perhaps, as satisfactory as is possible with our present knowledge, but they do not appear to us to clear up the subject entirely. One can easily conceive of a subconscious personality under many normal conditions. Our common automatic movements naturally suggest it, and it may come more visibly into play under certain quasi pathologic conditions. The complete change of personality, however, many instances of which have been reported where the subject apparently takes up an entirely distinct and seemingly normal existence, is not so easily explainable. If we can exclude delusions, epileptic states which are themselves somewhat obscure and hysterical deception in these cases, there is left a rather difficult problem. The subject, however, is well studied in many of its aspects by the author and the work can be profitably pursued by anyone interested in such studies.

PRACTICAL PEDIATRICS. A Manual of the Medical and Surgical Diseases of Infancy and Childhood. By Dr. E. Graetzer, Editor of the *Centralblatt fur Kinderheilkunde* and the *Excerpta Medica*. Authorized Translation, with Numerous Additions and Notes, by Herman B. Sheffield, M.D., Instructor in Diseases of Children, and Attending Pediatrist (O.P.D.). Flexible Cloth. Pp. xii-544. Price, $3.00 net. Philadelphia: F. A. Davis Co.

The stated purpose of this volume is "to be brief and to the point, and contain as many parenthetical points as possible, so as to permit at a glance of the selection of the more important from the less important material." A book of this kind is usually justly subject to adverse comment because it recounts symptoms and remedies without discussing fundamental conditions and treatment principles; the result is a jumble of details difficult to assimilate and supplying no knowledge of relative values; accurate and complete, perhaps, but neither clear nor discriminating; really "practical," therefore, only in appearance. The present volume, however, is singularly free from the faults of its class. Of course, this book presupposes familiarity with disease in adults, and naturally it will not take the place of a thorough treatise on diseases of children. The section on the now very important subject of modification of cow's milk is notably unsatisfactory, but the chapter on palatable prescribing is valuable. With Dr. Sheffield's timely comments and addenda the book is generally up-to-date and extensive in its range.

LEHRBUCH DER KINDERKRANKHEITEN für Ärzte und Studirende von Dr. Adolf Baginsky, Professor der Kinderkellkunde an der Universität Berlin. Achte völlig neu durchgearbeitete und verbesserte Auflage. Paper. Pp. 1168. Leipzig: Verlag von S. Hirzel, 1903.

This classic on children's diseases appears in its eighth edition. Baginsky's book represents his own vast experience together with a painstaking study of the literature. The new edition follows very shortly on the seventh, indicating the large circulation which the book enjoys. Nearly every chapter gives evidence of alterations and additions. The subject matter is thoroughly reliable and altogether up to date. It would be difficult to select any subject which is not carefully and exhaustively considered. The subjects of diphtheria, typhoid fever, gastrointestinal diseases and the diseases of the new born are especially attractive. They contain the results of the author's extensive personal observations and clinical studies. The study of infant feeding is not treated in a dogmatic way, and the various plans of feeding which are in vogue in the different centers are discussed at some length. He advocates pure milk, properly diluted, whatever method be employed. The proprietary foods are mentioned and methods of administering them discussed, though their use is not advised.

MALFORMATIONS OF THE GENITAL ORGANS OF WOMAN. By Ch. Debierre, Professor of Anatomy in the Medical Faculty at Lille. With 85 Illustrations. Translated by J. Henry C. Simes, M.D., Emeritus Professor of Genito-Urinary and Venereal Diseases in the Philadelphia Polyclinic. Cloth. Pp. 182. Price, $1.50 net. Philadelphia: P. Blakiston's Son & Co. 1905.

This work is of little practical use to the general practitioner and perhaps is not intended for him. The conditions it describes are not often met in practice. Many of the anomalies noted are of medicolegal importance, but the quotations from French non-medical writers might well have been omitted.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS will not be noticed. Queries for this column must be accompanied by the writer's name and address, but the request of the writer not to publish name or address will be faithfully observed.

METHOD OF GIVING YEAST IN TUBERCULOSIS.

——, Aug. 15, 1905.

To the Editor:—Will you kindly enlighten me as to the proper way to administer yeast in the treatment of tuberculosis? Your review of article in the London *Lancet*, by W. R. Huggard, appearing in THE JOURNAL, July 1, 1905, says nothing about doses, time of administering, etc. If brewers' yeast is not accessible, could ordinary home-made yeast be used safely? J. W.

ANSWER.—It has not been definitely determined just what is the best way to administer yeast in the treatment of tuberculosis. Huggard and Morland have given the dried yeast suspended in milk or water, which may be drunk during the meal. Their doses have varied from three to ten grams (a piece the size of a filbert to that of a walnut) twice daily. A good variety of common pressed yeast may be used. The German *Presshefe* is preferred by some. More recently Huggard and Morland have been giving ten grams every five days as an experiment. This was suggested to them by the observation that the opsonic power of the blood (see JOURNAL A. M. A., 1904, vol. 42, p. 1689) often falls somewhat immediately after the ingestion of yeast, but later rises above the normal level, and stays there for several days. They believe that the beneficial results of yeast are attributable to this rise in the opsonic power of the blood, which is a direct aid to phagocytosis. We would advise that too much dependence be not placed on the treatment till further evidence be produced regarding its true value.

State Boards of Registration

COMING EXAMINATIONS.

Wyoming State Board of Medical Examiners, State Capitol, Cheyenne, Wyo., September 6. Secretary, S. B. Miller, Laramie.

Massachusetts Board of Registration in Medicine, State House, Boston, September 12-13. Secretary, E. B. Harvey, Boston.

Michigan June Report.—Dr. B. D. Harison, secretary of the Michigan State Board of Registration in Medicine, reports the examination held at Lansing, June 13, 1905. Sixty-eight candidates were examined, of whom 67 passed and 1 failed. The following colleges were represented:

PASSED.

College.	Year Grad.	Per Cent.
University of Michigan	(1905) 89.84, 88, 84.94, 91.10, 87.42, 88.26, 78.31, 84.73, 91.47, 87.85, 88.57, 88.31, 87.52, 89, 87.57, 89.75, 87.36, 92.89, 86.52, 86.31, 85.73, 86, 88.42, 89.94, 83.47, 85.26, 86.42, 90.21, 85, 88.52, 90.36, 83, 84.05, 90.68, 86.52, 83.26, 86.36, 86.26, 82.10, 83.36, 89, 90.63; (1904) 88.42, 83.94, 88.57, 85.10, 88.84, 87.47, 84; (1903) 87.	
University of Michigan, Homeo. Dept.	(1905) 88.57, 83.78, 84.57; (1903) 84.89.	
Woman's Med. Coll., Philadelphia	(1904)	91.89
College of P. & S., Chicago	(1898) 75.42; (1896)	75.21
Kentucky School of Medicine	(1904)	85.10
Detroit Coll. of Med	(1905) 70.42, 80.26, 79; (1902)	85.89
American Med. Miss. Coll.	(1901) 87.84,	83.94
Royal University of Turin, Italy	(1895)	84.57
New York Homeo. Med. Coll.	(1905)	86.21

FAILED.

College of P. & S., Chicago	(1903)	66.31

The general average attained by representatives of the University of Michigan, excluding graduates of the homeopathic department was 87.1.

Ohio June Report.—In the report of the examinations held in June and published in THE JOURNAL, Aug. 19, 1905, the

percentage of 88 attained by one graduate of the Western Reserve University was omitted. The general average attained by representatives of Cleveland College of Physicians and Surgeons was given as 82 when it should have been 89.14.

The Public Service

Army Changes.

Memorandum of changes of stations and duties of medical officers, U. S. Army, week ending Aug. 19, 1905:

Rand, I. W., asst.-surgeon, granted leave of absence for one month, with permission to apply for an extension for one month.

Carter, Edward C., surgeon, leave of absence extended one month.

Heard, George P., asst.-surgeon, having reported arrival at San Francisco, Cal., from Manila, P. I., will take station at Army General Hospital, Presidio of San Francisco, Cal.

Glennan, James D., surgeon, and Darnall, C. R., asst.-surgeon, detailed members of examining board at Fort Monroe, Va.

Davidson, W. T., asst.-surgeon, relieved from duty at Army General Hospital, Presidio of San Francisco, and ordered to Presidio of Monterey, Cal., for temporary duty.

Gibner, Herbert C., and Bruns, Earl H., asst.-surgeons, relieved from duty with troops now on duty at the Sequoia and Yosemite National Parks, Cal., and to accompany Fifteenth Infantry to Philippine Islands. On arrival at Manila to report to commanding general, Philippines Division, for assignment to duty.

Cornman, Leighton R., contract surgeon, ordered from Army General Hospital, Presidio of San Francisco, to his home, Lowell, Mass., for annulment of contract.

Clayton, George R., contract surgeon, granted leave of absence for one month.

Lauderdale, C. E., dental surgeon, granted one month's leave of absence.

Stearns, Charles H., contract surgeon, returned from leave of absence to duty at Fort Monroe, Va.

Hallwood, J. B., contract surgeon, returned from leave of absence to duty at Fort Leavenworth, Kan.

Kleruluff, H. Newton, contract surgeon, relieved from further duty in the U. S. Transport Service, and ordered to duty in Philippine Islands.

Lemmon, Robert, contract surgeon, left Fort Preble, Maine, and arrived at Fort McKinley, Maine, for duty.

Wertenbaker, C. I., contract surgeon, left Madison Barracks, N. Y., en route to Ogdensburg, N. Y., with Third Battalion, Twenty-third Infantry.

Dougherty, J. C., contract surgeon, returned to duty at Fort Slocum, N. Y., from detached service at Fort Monroe, Va.

Byars, C. R., contract surgeon, returned to duty at Fort Sam Houston, Texas, from temporary duty at Fort McIntosh, Texas.

White, J. S., contract surgeon, left Fort Harrison, Mont., for his proper station, Fort Snelling, Minn.

Lowe, Thomas S., contract surgeon, will accompany Third Squadron, Thirteenth Cavalry, to Fort Sill, Okla., on completion of which duty will avail himself of leave of absence.

Navy Changes.

Change in the Medical Corps, U. S. Navy, for the week ending Aug. 19, 1905:

Brooks, F. H., asst.-surgeon, ordered to the Naval Hospital, New York.

Dunbar, A. W., surgeon, detached from the *Wyoming* and ordered home to wait orders.

Ames, H. E., medical inspector, detached from the Naval Academy and ordered to the *Maine*, for duty as fleet surgeon of the North Atlantic Fleet.

Lewis, D. O., medical inspector, detached from duty on the *Chicago* as fleet surgeon of the Pacific squadron and ordered home to wait orders.

Beyer, H. G., medical inspector, detached from the Naval Medical School, Washington, D. C., and ordered to special duty in connection with an international congress, Paris, France, and thence to the Asiatic fleet, for duty as fleet surgeon.

Dickson, S. H., medical inspector, detached from the *Maine* and from duty as fleet surgeon of the North Atlantic fleet, and ordered home to wait orders.

Biddle, C., surgeon, detached from duty as fleet surgeon of the Asiatic fleet, and ordered to the *Chicago* for duty as fleet surgeon of the Pacific squadron.

Berryhill, T. A., surgeon, ordered to Washington, D. C., September 1, for duty as instructor at the Naval Medical School, Washington, D. C.

Gatewood, J. D., surgeon, ordered to Washington, D. C., Aug. 22, 1905, for duty as instructor at the Naval Medical School.

Benton, F. L., P. A. surgeon, ordered to the Naval Hospital, New York, N. Y., for duty.

Murphy, J. A., P. A. surgeon, detached from the Naval Medical School, Washington, D. C., and ordered to the *Des Moines*.

Public Health and Marine-Hospital Service.

List of changes of station and duties of commissioned and non-commissioned officers of the Public Health and Marine-Hospital Service for the seven days ending Aug. 16, 1905:

Sawtelle, H. W., surgeon, leave of absence granted him for one month from July 21, 1905, amended so as to be for twenty-three days.

Sawtelle, H. W., surgeon, to proceed to Norfolk and other points in state of Virginia for special temporary duty.

Cofer, L. E., P. A. surgeon, to proceed to Hile, T. H., for special temporary duty.

Lavinder, C. H., P. A. surgeon, to proceed from Gulfport, Miss., to New Orleans, La., and report to Surgeon J. H. White for special temporary duty.

von Eadorf, R. H., P. A. surgeon, relieved from duty in the Canal Zone and directed to proceed to New Orleans, La., and report to Surgeon J. H. White for special temporary duty.

King, W. W., P. A. surgeon, to proceed to San Juan, Porto Rico, for special temporary duty.

Goldberger, Joseph, P. A. surgeon, to proceed from Mansfield to Alexandria, La., for special temporary duty.

Stimson, A. M., asst.-surgeon. Department letter of July 10, 1905, amended so as to grant him leave of absense for seventeen days instead of one month and fourteen days.

Ebert, H. G., asst.-surgeon. Department letter of July 13, 1905, granting him leave of absence for a period of two months from Aug. 4, 1905, revoked.

Addis, W. E., acting asst.-surgeon, to proceed to Jackson, Miss., and report to P. A. Surgeon G. B. Young for temporary duty.

Cleavea, F. H., acting asst.-surgeon, granted leave of absence for one day, Aug. 3, 1905.

Gray, R. H., acting asst.-surgeon. Department letter of June 24, 1905, amended so as to grant leave of absence for twenty-five days from July 6, instead of thirty days.

Houghton, M. W., acting asst.-surgeon, granted leave of absence for one day, Aug. 31, 1905.

Kennard, K. S., acting asst.-surgeon. Department letter of July 26, granting him leave of absence for a period of twenty-one days from Aug. 7, 1905, cancelled by Department letter of Aug. 11, 1905.

Nall, R. P., acting asst.-surgeon, to proceed to Jackson, Miss., and report to P. A. surgeon G. B. Young for temporary duty.

Stuart, A. F., acting asst.-surgeon. Department letter of May 27, 1905, amended so as to grant him leave of absence for twenty-eight days instead of thirty days, from July 3, 1905.

Rolsadorf, H. E., pharmacist, to proceed to San Juan, Porto Rico, for special temporary duty.

Health Reports.

The following cases of smallpox, yellow fever, cholera and plague have been reported to the Surgeon General, Public Health and Marine-Hospital Service, during the week ended, Aug. 21, 1905:

SMALLPOX—UNITED STATES.

California: Los Angeles, July 22-August 8, 5 cases.
Florida: Jacksonville, July 22-August 5, 2 cases.
Illinois: Chicago, August 5-12, 6 cases; Danville, July 29-August 8, 1 case.
Indiana: South Bend, July 29-August 12, 2 cases.
Kentucky: Lexington, July 22-August 3, 3 cases.
Louisiana: New Orleans, July 29-August 12, 5 cases.
Massachusetts: Lowell, August 5-12, 3 cases.
Missouri: St. Joseph, July 22-29, 1 case.
New Hampshire: Nashua, July 23-August 12, 3 cases.
New York: New York, July 29-August 5, 3 cases, 1 death.
Ohio: Cincinnati, August 3-12, 5 cases.
Pennsylvania: August 5-12, Altoona, 1 case; York, 2 cases.

SMALLPOX—INSULAR.

Philippine Islands: June 3-10, 1 case.
Porto Rico: San Juan, June 1-30, present.

SMALLPOX—FOREIGN.

Brazil: Bahia, July 1-8, 1 death; Rio de Janeiro, July 2-9, 15 cases, 1 death.
Chili: Iquique, July 15-22, 1 case.
France: Paris, July 15-22, 37 cases, 2 deaths.
Great Britain: July 15-22, Birmingham, 3 cases; Bristol, 1 case; London, July 8-15, 2 cases; Manchester, July 15-22, 1 case; New Castle-on-Tyne, July 8-22, 3 cases; Nottingham, July 22-29, 1 case.
India: Calcutta, June 24-July 8, 7 deaths; Madras, July 1-7, 3 deaths.
Italy: Catania, July 21-27, 2 deaths.
Russia: Moscow, July 8-22, 7 cases, 9 deaths; Odessa, July 15-22, 3 cases.
Turkey: Constantinople, July 16-23, 3 deaths.

YELLOW FEVER—UNITED STATES.

Louisiana: Bellevue, August 7, 4 cases; Shreveport, August 1-9, 2 cases; New Orleans, July 21-August 11, 720 cases, 118 deaths.

YELLOW FEVER—FOREIGN.

Brazil: Rio de Janeiro, July 2-10, 27 cases, 12 deaths.
Guatemala: Livingston, July 15-22, 2 deaths; Zacapa, August 3, 9 deaths.
Honduras: Choloma: July 26, 10 cases, 4 deaths; Puerto Cortez, July 1-24, 25 cases, 6 deaths; San Pedro, July 26, 100 cases, 19 deaths.
Mexico: July 30-August 5, Coatzacoalcos, 1 case; Veru Cruz, 4 cases, 1 death.
Panama: July 18-25, Colon, 6 cases, 2 deaths; Panama, 8 cases, 2 deaths.

CHOLERA.

India: Calcutta, June 18-July 8, 20 deaths.

PLAGUE—INSULAR.

Philippine Islands: June 3-10, Cebu, 4 cases, 3 deaths; Manila, 1 case, 1 death.

PLAGUE—FOREIGN.

Australia: Maryborough, June 10-17, 10 cases, 7 deaths.
Brazil: Rio de Janeiro, July 8-16, 2 cases.
India: General, June 18-24, 5,078 cases, 4,563 deaths; Calcutta, June 18-July 8, 56 deaths.

Medical Organization

Georgia.

BARTOW COUNTY MEDICAL SOCIETY.—This society has perfected its organization and has adopted the constitution and by-laws as component branch of the state association. Dr. Alfred T. Calhoun, Cartersville, is president, and Dr. Oliver H. Buford, secretary.

CLARKE COUNTY MEDICAL SOCIETY.—Physicians of the county met at Athens, June 28, and with the assistance of Dr. Samuel C. Benedict, Athens, councilor for the eighth district, organized a society on the standard plan and elected the following officers: Dr. James C. Bloomfield, president; Dr. Daniel D. Quillian, vice-president; Dr. Henry M. Fullilove, secretary-treasurer, and Drs. Isham H. Goss, Samuel H. Dillard and —Echols, censors, all of Athens, Ga.

COBB COUNTY MEDICAL SOCIETY.—This society was organized in Marietta the last week in July with ten charter members and the following officers: President, Dr. Charles T. Nolan, Marietta; vice-president, Dr. E. M. Bailey, Acworth; Dr. William C. Humphries, Acworth, secretary and treasurer, and Drs. J. G. Malone, William A. Kemp, Marietta, and J. E. Lester, Kennesaw, censors.

JACKSON COUNTY MEDICAL SOCIETY.—At a meeting called at Jefferson, August 9, by Dr. William B. Hardman, Harmony Grove, councilor for the ninth district, the physicians of the county organized a society on the standard plan with the following officers: Dr. J. C. Bennett, Jefferson, president; Dr. Leonard J. Sharp, Converse, vice-president; Dr. John A. Bryan, Pendergrass, secretary, and Dr. Albert D. White, Pendergrass, treasurer.

Illinois.

BOONE COUNTY MEDICAL SOCIETY.—Physicians of the county met in Belvidere, July 14, and organized a medical society with the following officers: President, Dr. Robert W. McInnes; vice-president, Dr. Daniel E. Foote; secretary, Dr. R. Boyd Andrews, and treasurer, Dr. John B. Leitzell, all of Belvidere.

Indian Territory.

INDIAN TERRITORY MEDICAL ASSOCIATION.—At a conference July 13 in Oklahoma City, between committees representing both the Oklahoma and Indian Territory medical associations, with a view to the union of the two organizations when statehood is secured, it was decided to hold a joint meeting at Oklahoma City, May 8, 1906. Dr. William E. Dicken, Oklahoma City, was chosen president, and Dr. LeRoy Long, South McAlester, I. T., secretary, of the joint session.

Kansas.

COWLEY COUNTY MEDICAL SOCIETY.—The physicians of Cowley County met at Winfield, July 13, and with the aid of Dr. Oliver J. Furst, Peabody, councilor for the fourth district, organized a society on the standard plan with a charter membership of 14. Dr. James W. Sparks, Arkansas City, was elected president; Dr. Leon Jacobus, Winfield, vice-president; Dr. Ernest F. Day, Arkansas City, secretary, and Dr. H. L. Snyder, Winfield, treasurer. A preliminary meeting was held June 24 in Winfield.

Kentucky.

BOONE COUNTY MEDICAL SOCIETY.—This society met at Burlington, July 23, and adopted a constitution and by-laws.

MADISON COUNTY MEDICAL SOCIETY.—At the meeting of this society in Richmond, July 22, Dr. Frank H. Clarke, Lexington, president of the Kentucky State Medical Society, and Dr. Isaac A. Shirley, Winchester, made addresses on "Medical Organization."

Missouri.

WORTH COUNTY MEDICAL SOCIETY.—On July 12 Dr. E. H. Miller, councilor of the third district, met the physicians of the county at Grant City and assisted in the organization of a county society on the standard plan. Dr. Oliver P. M. Mills, Grant City, was elected president; Dr. E. Paulus Nesbitt, Sheridan, vice-president; Dr. J. K. Phipps, Grant City, secretary, and Dr. J. F. Bove, Allendale, treasurer.

Pennsylvania.

CLINTON COUNTY MEDICAL SOCIETY.—At the meeting held July 21, at Lock Haven, the committee appointed at the last meeting to submit a report on the matters outlined in Dr. McCormack's address, reported, recommending a uniform fee bill; the adoption of some system of delinquents throughout the county; minimum fee for examining appliaants for life insurance; a definite understanding about night calls, and fee for same; the holding of clinics at the hospital at each meeting of the society; a definite understanding as to what constitutes contract practice and rules governing the same; that all professional positions shall be paid according to regular fee bill rate, and the adoption of a resolution instructing the delegates to the state convention to concur in any movement tending to the unification of the profession in the state. The report was adopted and a committee consisting of Drs. Francis P. Ball, Lock Haven; C. L. Fulmer, Renovo, and Saylor J. McGhee, Mill Hall, was appointed to carry out the recommendations.

South Carolina.

FLORENCE COUNTY MEDICAL SOCIETY.—This society, at its meeting in Florence, July 10, elected Dr. N. W. Hicks, Florence, president, and adopted the by-laws suggested for county societies by the American Medical Association.

Therapeutics

[It is the aim of this department to aid the general practitioner by giving practical prescriptions and, in brief, methods of treatment for the diseases seen especially in every-day practice. Proper inquiries concerning general formulae and outlines of treatment are answered in these columns.]

Administration of Digitalis.

A Hecht, in *Amer. Jour. Med. Sciences*, states that in the treatment of diseases of the heart it is necessary not only to strengthen the heart muscles, but to keep up the patient's nutrition. For this reason drugs that tend to upset the patient's digestion must be avoided. In this connection he mentions digitalis as a preparation which is especially liable to disturb the stomach when it is in an atonic condition, as this drug is likely to remain in the stomach for a considerable length of time and to produce nausea. On this account he recommends that it be prescribed with agents which tend to counteract this tendency. The author recommends the following formula:

℞ Pulv. digitalis
Quin. hydrochlor., ää.....gr. xx 1 | 30
Ext. nucis vom.....gr. iv-vii | 25-.45

M. Ft. capsulæ No. xxx. Sig.: One capsule three times a day.

H. O. Hall, in *Amer. Medicine*, calls attention to the fact that digitalis may cause delirium and hallucinations which are sometimes attributed to the disease affecting the patient instead of to the digitalis. He, therefore, states that in all cases in which delirium occurs in patients suffering from heart diseases, it should be decided that the toxic effect of digitalis is not a factor in the production of these symptoms. This can be done by attention to the elimination, as digitalis is cumulative in action.

In cases of cardiac dropsy the following combination is recommended by Beasley:

℞ Infusi digitalis 3i 4
Potass. acetatis.....gr. x | 65
Tinct. opii.....m. v | 30
Aquæ chloroformi q. s. ad..... .....℥ss 15

M. Sig.: To be taken at one dose and repeated three times daily.

For nervous palpitation he recommends the following:

℞ Tinct. digitalis .....m. v | 30
Syr. aurantii 3i 4
Acidi hydrocyanici dil.....m. ii | 12
Aquæ camphoræ q. s. ad.....3i 30

M. Sig.: At one dose and repeat once in four hours if necessary.

A combination of digitalis, scilla and hydrargyrum, for the treatment of cardiac insufficiency, accompanied by edema and dropsy, is as follows:

℞ Pulv. digitalis
Pulv. scillæ
Pil. hydrarg., ää.....gr. i | 06
Ext. hyoscyami.....gr. ii | 12

M. Ft. pillula No. i. Sig.: One such pill twice daily.

The following combination is sometimes of value in heart cases:

℞ Tinct. digitalis.....m. x | 65
Spts. chloroformi.....m. xv 1
Inf. gentianæ co. q. s. ad.....3i 30

M. Sig.: At one dose and repeat three times daily. Or:

℞ Tinct. digitalis.....m. v | 30
Spts. glycerylis nitratis (1 per cent.) .m. i | 06
Tinct. strophanthi.....m. iii | 20
Caffeinæ citratæ.....gr. i | 06
Spts. arom. q. s. ad.....3i 4

M. Sig.: At one dose in a wineglass of water and repeat two or three times a day.

Lobar Pneumonia in Children.

Lobar pneumonia in infants, according to Koplik, in *Boston Med. and Surg. Jour.*, differs in children as compared to adults in that double pneumonia is less frequent in children and pneumonia of the upper lobes is more frequent. The treatment should be outlined in much the same manner as in other infectious diseases or in typhoid fever.

The temperature requires treatment according to the mischief it is doing. Some infants bear high temperature remarkably well, while others do not. Hydrotherapy is the sheet anchor in the treatment of temperature. And in its application it must be kept in mind that the Brand bath or the cold bath are second in importance to the milder measures of sponging or to the application of cold compresses wrung out of water at a temperature of from 75 to 80 F. Infants, as a rule, bear the cold bath very badly and when the reaction is delayed it is difficult, particularly in bottle-fed infants, to rouse them out of the depression caused by it. The author applies a definite index for hydrotherapy in these cases. If a child does not react from a cold sponge, a lukewarm sponge is applied, and in some infants it is impossible to sponge at all. In such cases he recommends compresses, wrung out of water at a temperature of from 75 to 80 F. and applied from the neck to the umbilicus.

The heart should always be supported if necessary. Children above 5 years of age require but little support for the heart, as a rule, while those under 5 frequently require active support.

Alcohol and digitalis are the best remedies in supporting the heart in lobar pneumonia in infants, using a reliable tincture of digitalis and alcohol in the form of whisky, which is much preferable, in the author's opinion, to brandy, and it should not be given in too large doses on account of the danger of upsetting the stomach. If cyanosis be present, showing the strain on the right ventricle, nitroglycerin is regarded as the most useful remedy, given in doses ranging from 1/100 to 1/150 grain (.0006-.0004) every few hours. In younger children a smaller dose is required. He pleads for greater caution in the use of strychnia in pneumonia on account of the dangers from strychnia poison and also because of the lack of knowledge as to its exact action. It should not be used in nervous children who, without its use, show tremors and unrest due to toxemia and high temperature. The nutrition of the patient is by far the most important thing to be considered in this disease. Water should be given frequently, if the tongue is dry, in teaspoonful doses, perhaps every half-hour, if it does not disturb the child too much. The hourly system of stimulation is to be condemned. The medicines and food should be given at about the same time if it can be so arranged, so as to disturb the patient as little as possible. If these intervals can be lengthened to every three hours so much the better for the patient, for rest is an important element.

[In bottle-fed infants and in young children it is often unwise to give food and medicine at the same time, as dislike for the medicine may cause the child to refuse to take the necessary nourishment.]

He has not seen much benefit from the use of oxygen. The room should be kept at a temperature of from 67 to 68 F. and well ventilated; it should be quiet and isolated.

Complications must be watched for. If during the course of the disease a high temperature reigns (105 F.) for any length of time, the ears of the patient must be examined, and if the temperature does not drop at the end of seven or eight days, the chest should be examined for effusion, and if that is absent, examine the heart carefully. The cough should be controlled and, if necessary, codein may be used, or paregoric or the wine of opium, rarely morphin or the stronger preparations of opium. In younger children tympanitis is troublesome and for its relief a calomel purge is of service.

Tympanitis embarrasses the heart (and by some authorities produces atelectasis of the lungs) and calomel relieves the condition when given in five-grain (.30) doses for a young child. Ordinarily one-half grain doses (.03) repeated every two hours will suffice.

[A warm mustard bath will often aid in giving relief when tympanites is present, especially if the bath be preceded by a colon flushing with warm water.]

Collapse is treated by warmth to the body and the internal administration of camphor and nitroglycerin.

Conjunctivitis.

In the treatment of chronic catarrhal conjunctivitis, the *Internat. Jour. of Surgery* recommends removal of the cause, the use of glasses to remove the eyestrain. Lachrymal and nasal troubles should be corrected. If atmospheric conditions are the cause a change of climate is recommended. Sometimes the occupation by working in irritating vapors produces this condition. After the cause has been removed the conjunctiva becomes normal, as a rule. In some cases a stimulating astringent is necessary. For this purpose the following combination is recommended:

℞. Zinci sulphatis.....gr. i |06
Aquæ dest.....℥i 30|
M. Sig.: A few drops to be instilled into the eye. Or:
℞. Acidi borici.....gr. xv 1|
Aquæ dest.....℥i 30|
M. Sig.: Use as an eye lotion. Or:
℞. Acidi tannici.....gr. x |65
Glycerini.....℥i 30|
M. Sig.: To be applied locally to the conjunctiva. Or:
℞. Argenti nitratis.....gr. ss |03
Aquæ dest.....℥i 30|
M. Sig.: Apply locally with an applicator.

Other astringents such as copper sulphate or alum may be lightly applied to the everted lid every other day. Ointments of mercury are also of service as follows:

℞. Ung. hydrarg. oxidi flavi.....gr. i |06
Lanolini.....℥i 4|
M. Ft. unguentum. Sig.: A small piece applied locally to the conjunctiva and light massage given to the closed lid. Or:
℞. Ung. hydrarg. ammon.....gr. i |06
Lanolini.....℥i 4|
M. Ft. unguentum. Sig.: A small amount to be applied locally.

It is often necessary in these cases to change from one remedy to another in order to obtain the best results. In cases of follicular conjunctivitis the general health and hygienic surroundings of the patient should be inquired into and the patient should, in a way, be quarantined, having a separate bed, bed linen, towels, etc. Internally, iron in some form is of value and locally the astringents used in the chronic catarrhal form are of service. The follicle may be destroyed by expression with the thumb nail or dressing forceps.

Psoriasis.

Shoemaker recommends the following application locally in the treatment of psoriasis:

℞. Acidi salicylici
Sulphuris sublim., ää.....℥i 4|
Olei eucalypti.....℥ss 2|
Ung. aquæ rosæ.....℥i 30|
M. Ft. unguentum. Sig.: Rub a small amount in well on the patches.

Internally, he recommends:

℞. Creosoti.....m. ii |12
Pepsini (scale).....gr. ii |12
M. Ft. capsulæ No. i. Sig.: One capsule three times a day, after meals.

He also recommends chrysarobin in the treatment of psoriasis, combined as follows:

℞. Olei cadini.....℥ss 2|
Chrysarobini.....gr. xx 1|30
Ung. zinci oxidi.....℥i 30|
M. Ft. unguentum. Sig.: Apply locally to the affected areas.

Erysipelas.

In order to prevent the infection from spreading, Floeckinger, in *Amer. Therapist*, recommends that the border line be painted with pure tincture of iodin. If the point of origin can be located he cauterizes it with pure carbolic acid. He recom-

mends the tinctura ferri chloridi in doses of from 10 to 20 (.65-1.30) minims in glycerin every two or three hours. He also recommends the use of antistreptococcic serum as an injection in doses of 20 c.c., and he repeats the dose in from six to twelve hours, according to the severity of the infection. He regards this line of treatment as the most effective. Abscess formation demands multiple incision.

The *Med. Press* recommends the following combinations in the treatment of erysipelas:

℞. Guaiacol		
Tinct. iodi		
Spts. etheris, aa.....3i	4	
Menthol .....gr. i		06

M. Sig.: Paint the affected surface three or four times a day.

Internally the following may be used:

℞. Spts. camphoræ 3i	30	
Aquæ lauroceresi 3ss	2	
Syrupi simplicis 3i	4	
Misturæ amygdalæ 3iv	120	

M. Sig.: One tablespoonful every two hours, followed by a warm drink.

Medicolegal

Conclusions Based on Narrations of Patient.—The Supreme Court of Illinois says, in Stevens vs. People, that, while it is competent to show exclamations indicating pain as being some evidence of pain itself, and to show where the patient locates the seat of his or her suffering, this court knows of no well considered case where it is held competent for the physician to testify that he reached his conclusion or formed his opinion as to the ailment or physical condition of the patient from the cause or history of the injury, ailment or disease as narrated by the patient.

Railroad Company Not Liable for Negligence at Hospital.—The Court of Appeals of Kentucky says, in Illinois Central Railroad Company vs. Buchanan, that the latter party while in the service of the railroad company had his kneecap broken and was sent to the Illinois Central Hospital for treatment. He subsequently brought this action against the railroad company for damages, claiming that while under the care of the physicians and nurses of the hospital he was unskillfully and improperly treated. It was shown, however, that the Illinois Central Hospital Association, which conducted the hospital, was a separate and distinct corporation from the railroad company, although all officers and employes of the railroad company were made members of the corporation, with certain exceptions, and sums which the members were required to pay were collected by the railroad company to pay the expenses of the hospital, and went into the hands of the treasurer of the hospital association, who was also the treasurer of the railroad company. So the court says that the proposition was presented that, because the railroad company simply acted as the agent in the gathering of the funds from its employes for the hospital purposes, it thereby made a contract to be responsible for the conduct of those in control of the hospital. The conclusion reached by the court is that the railroad company was in no way liable for the conduct of the directors of the hospital corporation, or the physicians or the attendants at the hospital. The court says that if the railroad company was the real party at interest, and was simply using the hospital association for its financial profit, then the court might consider whether or not it was a case where it should look at the substance, and not the shadow, of things, in determining its liability. Doubtless the railroad company was indirectly benefited by its employes having proper and humane treatment at the hospital prepared for them, but that incidental benefit could not raise the question suggested, nor make it liable for the act of servant or agent of an independent corporation.

Status Lymphaticus Death During Chloroform.—The Second Appellate Division of the Supreme Court of New York says that the trial judge told the jury in the malpractice case of Wood vs. Wyeth that in a civil case the evidence to establish negligence must be just as strong as that required to establish guilt in a prosecution for manslaughter. No discussion is necessary to show that such is not the law. It is conclusively settled by authority in the state of New York that in a civil case the plaintiff rests only under the burden of proving his case by a preponderance of evidence, and not beyond a reasonable doubt. The law required that the physician, on undertaking treatment of the patient, should possess that reasonable degree of learning and skill ordinarily belonging to a physician and surgeon in the locality in which he practiced, and imposed on him the duty to use reasonable care and diligence in the exercise of his skill and the application of his learning, and to act according to his best judgment. It was conceded on the trial that there was no question as to the physician's learning or skill, so that the only remaining questions were whether he used reasonable care and diligence in the exercise of his skill and the application of his learning to accomplish the purpose for which he was employed, and whether he acted according to his best judgment. If he did, he was not legally responsible for the death of the boy. According to the physician, he found the patient suffering from blood poisoning, which was in danger of becoming general. His temperature was more than 100 degrees, and he knew positively that blood poisoning was going to get into his system. He thereon resolved to operate on the boy that day, to try to save him from this general blood poisoning. He then questioned the patient as to whether he had had any breakfast, and the boy responded that he had had a piece of meat and some bread. He used chloroform as an anesthetic instead of some other agent because he believed it was safe and better for the child, who presented such a bad appearance that the physician did not intrust anybody else to administer the chloroform, but gave it himself. Unfortunately, the chloroform proved fatal, because of a condition of the patient's system described as "status lymphaticus," not discoverable by any physical examination that could have been made before death. The theory of the plaintiff's counsel, as indicated by a question to the witness, was that the boy had eaten a breakfast consisting of a quarter of a pound of pork, a quarter of a pound of ham, four slices of bread, two eggs, and a cup of coffee, only three hours before the operation; but, if this were the fact, there was no evidence, the court says, that the physician was informed of it. The test here applicable to his conduct was not what the patient had actually done in the way of taking food, but what the patient told the physician on that subject. The case, instead of being one of negligence, appeared to be only another melancholy instance of a death on the operating table in a charity hospital of a patient being treated with a high degree of skill and care by a surgeon of unquestioned learning. Such a death is always painful enough to the conscientious surgeon under whose care it occurs, but it can not subject him to any legal liability, where there is no sufficient proof that he was derelict in the performance of his professional duty toward his patient.

Admissibility of Dying Declarations.—The Supreme Court of Illinois says, in Brom vs. People, that the admission of the dying declaration of the deceased in a homicide case forms an exception or qualification to the well-settled rule that secondary or hearsay evidence is not admissible. The reasons usually given in the books for the admission of such declarations are, first, that the solemnity of the occasion under which they are made dispenses with the necessity of an oath; and, secondly, the impossibility in many cases of producing better proof of the homicide makes it necessary that such declarations be admitted in order that those clearly guilty may not escape punishment. Such declarations are made not under oath. There is no opportunity given to cross-examine the party making the same, and the accused is deprived of the right to meet his accuser before the court and jury face to face, and the courts for those reasons are not disposed to extend the rule to embrace cases which do not clearly fall within all its limitations. The cases in which said declarations are admitted have been confined by the courts to cases where the declarations were made by the injured party under the fixed belief and moral conviction that his death was im-

pending and certain to follow almost immediately. The declarant in this case may have been excited from what the physicians told him, and may have thought, from his condition, that he would not get well, and that he might eventually die from the effects of his wounds. That, however, was not sufficient to make the declaration admissible. He must have entertained at the time he signed the declaration a fixed belief and moral conviction that his death was then impending, and certain to follow almost immediately. The question of his belief that his death was impending and certain to follow almost immediately could not alone be determined from what the physician testified he said on that subject on the occasion of signing the instrument, but his acts were to be considered in connection with his words, as well as the circumstances which surrounded him at the time the declaration was signed, in determining what his belief relative to his immediate death was at that time. Furthermore, while the court does not hold that he could not have ratified a statement prepared the previous evening by the state's attorney, so as to have made it his dying declaration, the evidence that he did ratify it after he was impressed with impending death should be of such a character as to satisfy the mind of such ratification beyond any reasonable doubt.

Operation to Improve Appearance After Injury.—The Supreme Court of Oregon says that in the personal injury case of Busch vs. Robinson, where the plaintiff's hand was caught between the rollers of a mangle, a physician, after describing the extent of the injury, and that there was a webbing of the fingers down to the middle joint, testified that the cosmetic effect of the hand would be improved by an operation dividing the fingers again so that the woman could wear a glove; that, while it would probably not improve the usefulness of the hand, it would much improve its appearance; and that the reasonable charges of a surgeon for performing the operation would be about $100. He further testified, over objection, that it would be better for the plaintiff to go to a hospital during the operation and treatment, and that the expense there would be $2 a day for about thirty days. The objection to this testimony was that the expense attending the further treatment of the hand to improve its appearance was not a proper element of damages for the jury's consideration. But the court says that it would seem that the operation or further treatment and the expense attending it would be but the natural and probable result of the injury—as much so, almost, as it was necessary to employ a surgeon in the first instance to secure proper treatment for saving the hand, if possible. It was, therefore, within the rule for the measure of damages.

Current Medical Literature

AMERICAN.

Titles marked with an asterisk (*) are abstracted below.

American Medicine, Philadelphia.

August 12.

1 *Conditions Determining Variations in the Energy of Tumor Growths. L. Loeb, Philadelphia.
2 *Infection in Transportation. H. M. Bracken, Minneapolis, Minn.
3 *Diseases of the Heart and Their Treatment: A Synopsis. O. Lerch, New Orleans, La.
4 *Study of Enzyme Action and its Relation to Human Metabolism and the Development of Tuberculosis. H. E. Lewis, Burlington, Vt.
5 *Anastomosis and Transplantation of Blood Vessels. A. Carrel, Chicago.
6 *Mercuric Chlorid, Intravenously or Intramuscularly, for Epidemic Cerebrospinal Meningitis. R. Hogner, Boston.

1. Conditions Determining Variations in Energy of Tumor Growths.—Loeb asserts the rate of tumor growth is not only influenced by the species into which the tumor is transplanted, but also by variations which exist among individuals or families of the same species. Under certain conditions a state of active immunity can be experimentally produced. It can be accomplished more easily with some tumors than with others. The energy of tumor growth can be experimentally increased through successive transplantations up to a certain maximum. It is also possible to cause an experimental decrease in the energy of tumor growth. These variations are caused by a direct stimulating or depressing effect on the tumor cells. Contact metastases may occur, and different tumors which are morphologically similar or identical behave differently in this respect. The greatest care ought to be exercised to prevent a tumor from touching the wound during extirpation. The fact that surgeons operating on tumors do not become infected agrees with the facts found in experimental tumor inoculations. Tumor growth is primarily due to an increased energy of growth of those cells from which the tumor takes its origin; it can not be due to a lowered resistance of the organism in which the cells carry on their apparently unlimited growth. If a tumor can not be successfully inoculated into other animals, it is probably not due to the fact that other animals are more resistant toward the growth of inoculated tumor cells than the animal in which the tumor growth developed originally, but to other causes still unknown.

2.—See abstract in THE JOURNAL, May 27, 1905, page 1707.

3. Diseases of Heart and Their Treatment.—Lerch emphasizes the fact that health and life depend largely on the equilibrium that exists between arterial and venous pressure. As long as compensation is perfect, no matter what the lesion may be, the patient does not suffer any inconvenience. The object, therefore, of all treatment must be to keep such a compensation or to re-establish it when lost. In patients with a completely broken compensation rest and drugs must be used. As soon as the compensation is re-established mechanical and dietetic treatment must take the place of drugs, and if under its employment the heart again begins to fail, the prognosis is grave.

5. Anastomosis and Transplantation of Blood Vessels.—Carrel states that when a segment of artery is removed the circulation may be restored in the peripheral portion by interposing between the cut ends a segment of vein. Experiments on dogs were undertaken with the view of finding a new treatment of aneurism. A segment of carotid or femoral artery was resected. The continuity of the vessel was restored by interposing a segment of jugular or femoral vein. After completion of anastomosis, the peripheral arterial circulation was immediately restored. The anastomosis and the venous wall adequately support the arterial blood pressure. The circulation below the venous segment appears normal.

6. Mercuric Chlorid in Epidemic Cerebrospinal Meningitis.—Hogner has found intragluteal injections of mercuric chlorid, twice a day, of great value in the treatment of epidemic cerebrospinal meningitis. He uses: Mercuric chlorid, 2 parts; sodium chlorid, 9 parts; distilled water to 1,000. One to 4 c.c. are used for intravenous or intramuscular injection, once or twice a day. The maximum dose intravenously is 4 c.c. of the solution. Hogner prefers the intravenous injections and he cautions against extravenous injections on account of the bad local effects.

Medical Record, New York.

August 12.

7 *New Method of Orchidopexy. C. Beck, New York.
8 *Dynamics of Dreams. A. E. Gibson, Los Angeles, Cal.
9 *Length of Enteron (Small Intestine). B. Robinson, Chicago.
10 Position of the Bladder in Fibroid of the Uterus. J. A. Schmitt, New York.
11 Dual Genital and Extragenital Chancres—Chancre a Distance. M. L. Heidingsfeld, Cincinnati, Ohio.

7. New Method of Orchidopexy.—Beck says that the widespread opinion that a retained testicle will descend from the inguinal canal to the scrotum at the age of puberty is erroneous, and that while it may sometimes occur, he has never seen it do so himself. He, therefore, thinks it unwise to defer surgical action until puberty, owing to the risk of atrophy, and advises operation after the third year, unless there is some contraindication. His method of operating, which he calls the "necktie operation," is essentially as follows: The incision is like the Bassini incision, prolonged downward, and the testicle is lifted from its bed and freed from all adhesions. It is then pulled down into a pocket prepared for it in the scrotum. In order to secure it there, a flap is dissected from the outer margin of the inguinal ring downward, and turned in such a manner that it can be attached to the opposite layer in a semilunar shape. Thus this band surrounds the testicle

like a necktie, the testicle being retained as in a buttonhole. The length of the semilunar flap will be dictated by the greater or lesser extensibility of the cord. The aponeurosis is then united above.

8. **Dynamics of Dreams.**—Gibson presents an exhaustive analysis of the physical and psychical basis of dreams and sums up his views in part as follows: Dream and waking differ in degree and form of manifestation only, not in principle and essence. Like waking consciousness, dream reveals, but does not create. The same world that surrounds the waking individual surrounds the dreamer, only the viewpoints and media of observation are changed. As the life experience of an individual in his waking consciousness receives its character and value by and through his power of response to environment, so in a similar way the value of a dream depends on the power of the ego to respond to consciousness in its various forms of emotions, ideas and feelings which constitute the environments of the subjective or dream plane. Waking or dreaming, the individual is, or becomes, what he chooses to be at any given moment of his existence. The background for ordinary dreams consists of undigested remnants of waking life. Hence, ordinary dreams are merely undigested life, being made up by longings, desires, anticipations, idle hopes and miscarried realizations, which, occupying the mind during the day, are overtaken by sleep before having reached their fruition. Hence the mixture, in most dreams, of the sane and the insane, of truth and delusion. On the other hand, the life lived out and assimilated in a purposeful existence becomes absorbed in the formation of character and leaves no residue to form the bizarre staging for the confused dream. And to such an individual the intuitions of dream life, with their dazzling imagery, will introduce symbols, which, properly interpreted, may carry the significance of prevision or prophecy. Therefore, to turn dreams into useful, intelligent and intelligible factors, we must fill our waking life with deeds and thoughts of universal usefulness, and freight the train of events with an unflinching devotion to duty and virtue.

9. **Length of Enteron.**—Robinson reports the results of measurements made at autopsies on 450 males and 150 females. The average length of the enteron in the males was 23 feet, and in the females was 19 feet. The length of the enteron may be very much modified by local or general disease, especially during childhood, and also by the character of the food consumed. The enteron increases in length most rapidly a few months subsequent to birth, when it may grow one and one-half feet a month, and it assumes its chief length in early childhood. A subject with a maximum length of enteron possesses a stronger constitution than a subject with minimum length, as he can digest and economize more food. The human enteron presents colossal differences as to length (males 11½ feet minimum, 32 feet maximum = 20 feet, and female, 10½ feet minimum, 30 feet maximum = 19½ feet). This variation of 20 feet is almost equal to the length of an average enteron. The enteron varies over double to two and one-half times its length. In adults the relation of the length of the enteron to the body length is as 7.2 to 1. There is a vast difference between the absolute and relative length of the enteron in man. The enteron measured *in situ* is 3 to 6 feet less in length than when extirpated. Different diseases of the enteron may result in elongation or contraction.

Medical News, New York.

August 12.

12 *An Analytical and Clinical Study of Thirty Cases of Ectopic Pregnancy. S. M. Brickner, New York.
13 *Treatment of Chronic Nasal Catarrhs with Sulphur. L. Kolipinski, Washington, D. C.
14 Treatment of the Individual Case in Appendicitis. C. C. Allison, Omaha, Neb.
15 Disease of the Pancreas. O. M. Logenecker, Rosedale, Kan.
16 Malarial Hemoglobinuria. L. A. Greene, Greenville, Fla.
17 The Doctor and the Public School. T. Toepel, Atlanta, Ga.
18 Case of Cervical Spina Bifida—Syringomyelomeningocele with Hydromyelus and Hydrocephalus. D. J. Davis, Chicago.

12. **Analytical Study of Ectopic Pregnancy.**—A clinical study of 30 cases leads Brickner to draw the following conclusions: Sterility does not necessarily precede the development of ectopic pregnancy. If it does exist, its cause is often the same as the cause of abnormal pregnancy. The main characteristic of the bleeding in ectopic gestation is its great irregularity, there being no type. As a general rule it is not profuse. It may be constant or intermittent, and its character or profuseness has no relation to the type of the lesion. A chilly feeling often accompanies the bleeding, and vomiting and nausea often accompany the first flow. The uterine flow has apparently no connection with the death of the fetus. The pain in tubal pregnancy is usually localized over the side of the lesion. It has no definite character; it may be cramplike over the affected tube; it may simulate labor pains; it may be sharp and sudden, or it may be of a bearing-down nature. The pain during a tubal abortion and that concomitant with the presence of a hematosalpinx is usually cramplike. The usual symptoms of pregnancy may be present. They are frequently absent, but their absence does not militate against the possibility or probability of an ectopic pregnancy. Tenderness on palpation of the mass adjacent to the uterus is of great diagnostic value when taken in connection with the history and the other pelvic findings. A rise of temperature between 99 and 100 F., in the absence of signs of infection, is worthy of consideration in the diagnosis. The causative factors of tubal pregnancy are probably numerous. Not one element, but many, may bring about the condition in different instances. It is likely that atavistic tendencies, congenital or acquired anomalies, pelvic inflammations, ovarian and tubal disease, all play a rôle in individual cases; but none of these factors alone is sufficient to explain all cases. There are as yet no definite data by which we can differentiate diagnostically between all the varieties of ectopic gestation. Occasionally this may be done, but it is impossible always to distinguish between an unruptured tube and a tubal mole. A hematocele and a freshly ruptured tube can almost always be differentiated from the other usual lesions.

13. **Treatment of Chronic Nasal Catarrh.**—In treating the several forms of chronic nasal catarrh it is Kolipinski's custom to have the patients seated with head erect and the mouth open. The anterior nasal cavity is exposed with a speculum, the tip of the nose elevated and the sulphur freely and thoroughly blown in with a strong powder blower. This has been properly done when the powder appears from mouth and opposite nostril and an irritative cough results. The treatment is repeated on the other side. The posterior nasal space and naso pharynx may also be treated directly by way of the floor of the nose or fauces. These procedures are not entrusted to the patient unless he is unusually attentive to his own case. They are made two or three times a week for a month, and once a week for the next two months. The local sensations of sulphur are not unpleasant. Occasionally in women it sets up a conjunctival hyperemia when used too profusely or when accidentally blown on the face, and some women complain of nasal irritation and pain; then it is best to use the treatment but once a week. The cases must be selected carefully, those in which there is no other primary nasal disease, deflection, deformity or growth must be treated surgically. This method of treatment has proved of value in simple, chronic, hypertrophic, atrophic and phlegmonous rhinitis; and in simple chronic and hyperplastic nasopharyngitis.

New York Medical Journal.

August 12.

19 Fatal Case of Bacillus Pyocyaneous Septicemia After Surgical Operation. J. B. Roberts, Philadelphia.
20 Adenoids. E. M. Sill, New York.
21 *Significance of Sudden, Severe, Abdominal Pain. E. A. Babler, St. Louis.
22 Tropical Disease of the Angola Highlands. F. C. Wellman, Benguella, West Africa.
23 Reflections at the Majority of a Parchment. W. B. Konkle, Montoursville, Pa.
24 *Unusual Sequel to Kraske's Operation. C. B. Kelsey, New York.
25 Six Lectures on the Diseases of the Blood. J. M. Swan, Philadelphia.

21. **Abdominal Pain.**—Babler urges that every effort be made to ascertain the true cause of any sudden, severe, persistent pain in the abdomen, and cautions against the use of morphin for the purpose of allaying the pain. A complete history of the patient must be secured and a careful examination made. Ascertaining the site of the initial pain is of more diagnostic value than the location of the diffuse pain. Such pain is of grave import and demands immediate investigation.

24. **Unusual Sequel to Kraske's Operation.**—Two years after the operation Kelsey's patient noticed a tumor over the sacrum which gradually increased in size. On examination this tumor proved to be a hernia escaping behind the rectum through the opening into the pelvis made by the old incision.

Boston Medical and Surgical Journal.

August 10.

26 Notes on X-Light. W. Rollins, Boston.
27 Three Cases Illustrating the Practical Importance of Recognizing the Post-Epileptic State. M. Prince, Boston.
28 Remarks on the Present Status of Surgical Treatment of Hepatic Cirrhosis. C. G. Cumston, Boston.
29 *Peroneal Resection as a Means of Correction in Rigid Valgus. C. F. Painter, Boston.

29. **Peroneal Resection in Rigid Valgus.**—Painter reviews the clinical history of valgus, which he divides into three classes of operative cases, and describes the treatment in vogue.

St. Louis Medical Review.

August 12.

30 *Scopolamin-Morphin as an Adjuvant in the Administration of General Anesthesia. M. G. Seelig, St. Louis.

30. **Scopolamin-Morphin as Adjuvant to General Anesthesia.**—The purpose of Seelig's paper is to present a series of 65 general anesthesia administrations, showing that the method used is one that merits recommendation and trial. This series included the following range of cases: Abdominal hysterectomy, 8; vaginal hysterectomy, 6; hernia, 5; plastic operations, 8; operations on the tubes and ovaries, 11; uterine fixations, 6; curettements, 6; hemorrhoids, 3; fistula in ano, 2; thyroidectomy, craniectomy, orchidectomy, appendicectomy, costectomy, nephropexy, tumor of breast, cyst of neck, pelvic abscess, exploratory laparotomy, one each. In every instance the patient received a hypodermic injection of scopolamin hydrobromid, grain 1/100, and morphin, grain 1/6, one half-hour before the administration of the general anesthetic. The general anesthesia was induced by means of the ethyl chlorid-ether sequence administered through the Bennett inhaler. Of these 65 patients only one vomited or retched while on the operating table. Seventy-seven per cent. of the patients did not vomit at all. One-third of the patients that did vomit, vomited only once, and then only from two drams to one ounce of clear mucus. Nausea was never pronounced except in two cases, and vomiting never occurred earlier than two hours after the operation. The advantages of this method are: Lessened amount of anesthetic necessary, absence of salivation, avoidance of the stage of excitement, marked reduction in the liability to vomit, and quiet and freedom from pain after operation.

Lancet-Clinic, Cincinnati.

August 12.

31 Intestinal Obstruction. F. F. Lawrence, Columbus.
32 Prophylaxis and Treatment of Gonorrheal Salpingitis Often Ending in Pyosalpinx. E. Ricketts, Cincinnati.
33 Abortions. J. A. Hall, Cincinnati.

California State Journal of Medicine, San Francisco.

July.

34 A Medicolegal Case. J. L. Asay, Santa Clara.
35 Is the Health of Los Angeles Menaced by Pulmonary Tuberculosis? G. H. Kress Los Angeles.
36 Adams-Stokes Syndrome. H. S. Gordon, Santa Ana.
37 *Use of Hyoscin Hydrobromate in Treatment of Morphin Habit. H. E. Bering, Tulare.
38 Uncinariasis in California. Based on Observation of Sixty-Two Cases. H. Gunn, San Francisco.
39 Adolescence in Girls. F. R. Burnham, San Diego.
40 Practical Method for the Determination of the Defects of the Special Senses in School Children. L. C. Deane, San Francisco.
41 Conveyance of Syphilitic Infection by Medical Men. D. W. Montgomery, San Francisco.
42 Case of Human Glanders. W. F. Cheney, San Francisco.
43 Typhoid Infection of the Hip Joint. S. J. Hunkin, San Francisco.
44 Remote Effects of Typhoid on the Bones and Joints. P. C. H. Pahl, Los Angeles.

37. **Hyoscin Hydrobromate for Morphin Habit.**—Bering advises placing the morphin habitué in a sanitarium where he can be under constant supervision and at the same time is removed from the sympathetic influence of friends. The room should be darkened and should contain as little furniture as possible. The patient must not be left alone a moment during the administration of the hyoscin, nor for the first twenty-four hours after the last dose of hyoscin has been given. The night before beginning treatment a vapor bath is given to secure free action of the skin. Bering also endeavors to secure free elimination of all toxic material from the system, using for this purpose strychnin sulphate in doses ranging from 1/32 to 1/8 grain every two hours, for three or four doses, with calomel, podophyllum, ipecac, etc. Hyoscin is then given in doses ranging from 1/100 grain every hour to 1/400 grain every four hours, until the full physiologic action is secured. From that time on just enough hyoscin should be given to continue this action for a period ranging from thirty to forty hours, when the hyoscin is discontinued, if the patient is free from pain and desire for the drug. If not, the hyoscin is resumed for another twelve or twenty-four hours. If the patient goes to sleep during the administration of the hyoscin no more is given until he awakens. Should the patient at any time show signs of pain, more hyoscin must be given. The action of hyoscin is not the same in any two patients. While it is perfectly safe if used carefully, it is a powerful agent for harm when not so used. Each patient must be closely watched. If a cardiac stimulant is required, Bering gives spartein sulphate in 1/8 to 1/4 grain doses, repeating the dose every four to six hours, as indicated.

Illinois Medical Journal, Springfield.

July.

45 Report of Cases. S. C. Plummer, Chicago.
46 *Indications for Opening the Mastoid Process in Cases of Acute Empyema of the Cells When There Is an Absence of Signs Over the External Surface of the Mastoid. G. E. Shambaugh, Chicago.
48 *Errors in the Diagnosis of Abdominal Troubles. C. U. Collins, Peoria.
49 *Surgical Tuberculosis. W. E. Guthrie, Bloomington.
50 *Tubercular Nephritis—Review of Literature. R. J. Christie, Jr., Quincy.
51 *Prophylaxis of Syphilis. A. Schalek, Chicago.
52 Pathologic Anatomy of Lacerations of the Obstetrical Canal Resulting from Obstetrical Injuries. J. C. Webster, Chicago.
53 Poisoning from Oil of Wintergreen. F. C. Vandervoort, Bloomington.
54 *License and Control of Practice of Medicine in Illinois. G. W. Webster, Chicago.
55 *Intussusception in Infancy and Childhood with Collection of 1,028 Cases with Statistics. J. H. Hess, Chicago.
56 *Important Points in the Technic of Perineal Prostatectomy. A. J. Ochsner, Chicago.

46.—See abstract in THE JOURNAL, June 3, 1905, page 1802.

48.—Id., June 3, 1905, page 1801.

49.—Id., June 3, 1905, page 1801.

50.—Id., June 3, 1905, page 1801.

54.—Id., May 27, 1905, page 1705.

55.—Id., June 3, 1905, page 1802.

56.—**Important Points in the Technic of Perineal Prostatectomy.**—The points mentioned by Ochsner are a free exposure of the gland, prevention of hemorrhage, sufficient retraction of the gland to enable keeping it under control during its removal, reduction of traumatism to a minimum, maintaining the continuity of the urethra, establishing good drainage and limiting the time of the operation in order to reduce the amount of shock and to lessen the harmful effects of the anesthetic on the kidneys.

Therapeutic Gazette, Detroit, Mich.

July 15.

57 *Two Additional Cases of Thoracic Aneurism and One of Innominate Aneurism Treated by Wiring and Electrolysis. H. A. Hare.
58 Guaiacol in Treatment of Pneumonia. W. G. Cain, Epping, N. H.
59 Clinical Study of the Relative Actions of Atropin and Homatropin as Cycloplegics. O. Wilkinson, Washington.
60 Points in Palliative Gynecology. W. Krusen, Philadelphia.
61 Cysts of the Pancreas. R. P. McReynolds, Philadelphia.
62 General Practitioner as a Temporary Ophthalmologist. C. P. Franklin, Philadelphia.

57. **Aneurism Treated by Wiring and Electrolysis.**—The first case reported by Hare is that of a woman of 50 suffering from an aneurism involving the superior and posterior portions of the transverse arch of the aorta, including the origin of the large vessels. Gold wire to the amount of eight feet was passed into the sac through an ordinary insulated needle, and the electric current started at 5 milliamperes and gradually increased to 50 milliamperes, was passed through the sac for thirty minutes. Before the operation was completed the patient was relieved of pressure symptoms to some extent, and for several weeks afterward was able to sleep in a reclining posture with perfect comfort. Six months after the operation the growth which had been formed by the operation at the

margin of the clot began to enlarge and death finally occurred, the result of pressure on the trachea combined with exhaustion. At the autopsy the wire was found imbedded in a clot. The second case reported was that of a man who presented a mass which filled the epiclavicular space at the right side near the sternum and passed backward under the sternomastoid muscle. Two feet of gold wire were introduced into the tumor, which proved to be an aneurism, and electrolysis was used, as in the first case, for forty minutes. Two weeks after the operation the area into which the wire had been introduced was firm and devoid of expansile pulsation. Death took place two months later, the result of exhaustion and interference with respiration and deglutition. The aneurism took its origin from the inferior portion of the wall of the innominate artery. The sac was lined with a laminated clot, the interior of which was occupied by a black, rather thick liquid. No trace of the wire could be found in any part of the clot. In the third case, one of aneurism of the thoracic aorta just below its descending portion, nine feet of wire were introduced and the electric current was passed for about three-quarters of an hour. The patient lived four months, dying at the end of that time from pressure and exhaustion. The autopsy revealed an enormous laminated clot filling the entire sac, with the wire coiled in the center of the aneurism, embedded in fibrin, through which the blood had formed a channel. Hare says that it is noteworthy that practically in all these cases the operation was followed by immediate relief of the pressure symptoms, and a diminution in the expansile pulsation of the part operated on. The degree of relief varied very considerably, but all the patients experienced some benefit. Several of them volunteered the information that they felt amply repaid for the operation by the relief which they obtained. In each instance the ultimate death of the patient in no way proved that the operation was at fault. It indicated only that the disease in the blood vessel wall was so extensive that the point of greatest weakness having been reinforced, the vessel then gave way at the margin of the clot, and at a place where operative interference could not well be undertaken. In each instance the operation probably prolonged life. The operation is performed under desperate circumstances, and the fact that it does not produce a permanent cure if every case in no way militates against its employment.

Cleveland Medical Journal.

July.

63 *New Operation for Hernia of the Pelvic Floor (Procedentia.) G. W. Crile, Cleveland.
64 Secondary Effects of Hypertrophy of the Third Tonsil. J. M. Ingersoll, Cleveland.
65 Pyrexia from Mechanical Intestinal Irritation in a Child. G. S. Smith, Cleveland.
66 Rash of Adults Simulating Exanthemata Due to Disturbance of the Digestive Tract. N. Rosewater, Cleveland.

63. New Operation for Hernia of Pelvic Floor.—After two complete attempts to correct a complete hernia of the pelvic floor, Crile finally succeeded by performing an operation which he describes as follows: With the patient in the Trendelenburg posture, a median incision of good length was made; approximately one-fourth of the entire abdominal contents were withdrawn from the hernial sac, the pelvic floor steadied and the hernia reduced. The bladder was found well down in this cavity and totally prolapsed. An anteroposterior incision was made across the middle of the floor of the pelvis, dividing the vagina into two lateral halves. The vaginal mucous membrane of the part to be brought through the abdominal incision was removed. The bladder was separated from the vagina for some distance downward. It was then found that the vagina and the floor of the pelvis had been so stretched that they could easily be brought out through the abdominal wound beyond the surface of the skin. After making an incision through the abdominal fascia 4 cm. from the median line on each side, the fibers of the recti were separated and the peritoneum perforated. Each half of the split vagina with the attached uterosacral and uteropelvic ligaments and all the other structures of the floor of the pelvis, together with the round and broad ligaments, were drawn out through these openings on each side of the median incision. While the parts are well up in place so that the top of the incised vagina presented closely against the under surface of the peritoneum, the latter was sutured in this position with plain catgut. The original peritoneal incision, the muscle and the external fascia were then closed, the latter by continuous sutures of chromicized gut, after which the freed ends of the vagina and pelvic floor, which had been drawn up through the lateral openings in the peritoneum, recti and fascia, were united in the middle line by means of chromicized gut. The skin was then closed. The patient made a good recovery from the operation and was discharged in three and one-half weeks. For some time after the operation the patient felt a sensation of dragging on the wound and experienced some pain. This passed away after several months. She has been doing her usual work, and at the present time, more than three years after the operation, there has been no recurrence of the hernia. Crile says the indication for this operation exists only in the cases of complete hernia (procidentia). In the minor degrees of prolapse it would be quite impossible to carry out this technic for want of sufficient length of ligaments and of vagina to reach to the external fascia.

Journal of Cutaneous Diseases, New York.

July.

67 *Varicella Accompanying Herpes Zoster. W. T. Corlett, Cleveland.
68 Case of Acute Malignant Pemphigus (P. Vegetans), with Autopsy Report. O. S. Ormsby, and P. Bassoe, Chicago.
69 Clinical and Microscopic Reports of Dermatologic Cases. L. E. Schmidt, Chicago.

67. Varicella Accompanying Herpes Zoster.—Corlett reports 4 cases. The first patient was a woman, aged about 48, who came to see him because of herpes zoster involving the lateral surface of the neck, thence passing over the shoulder and down the arm and the trunk in the vicinity of the left mamma. On the back, chest and extremities were lesions resembling those of varicella. The only conclusion obtainable was that the patient had an attack of herpes zoster occurring simultaneously with varicella. The second patient was a man, aged 44, who had a herpes zoster frontalis with a typical varicella eruption on the chest, arms, legs and back. The third case, a man aged 40, corresponded to the first two. The fourth case, a man, aged 70, had herpes zoster in the area supplied by the second lumbar nerve and a varicella eruption on the trunk and forehead.

Washington Medical Annals.

July.

70 Treatment of Ulcers of the Cornea. S. B. Muncaster, Washington, D. C.
71 *Case of Typhoid with Complications. L. F. Friedrich, Washington.
72 Case of Fibro-Lipoma. J. F. Thompson, Washington.
73 Sporadic Cretinism. I. H. Lamb, Washington.
74 Gastroenterostomy for Non-Malignant Diseases of the Stomach and Duodenum. I. S. Stone, Washington.
75 Case of Porencephalus. G. N. Acker, Washington.
76 Rational Versus Empirical Therapeutics. A. B. Moore, Washington.
77 Two Cases of Goiter with Operations. G. T. Vaughan and A. A. Snyder, Washington.
78 Unusually Large Aortic Aneurism. W. H. Hough, Washington.
79 Uses and Abuses of Pelvic Massage. J. T. Johnson, Washington.
80 Case of Renal Calculi; Operation. J. F. Mitchell, Washington.

71. Typhoid with Complications.—The case reported by Friedrich is interesting because of the many and serious complications which developed. The fever was unusually irregular, the temperature often being 103 and 104 for two days, then dropping to normal, again rising, and again falling to normal and even subnormal, continuing thus an erratic course for three weeks, and then, without apparent cause, rapidly rising again. Vomiting was very persistent, the ejected matter containing mucus and bile. The abdominal symptoms were greatly exaggerated. The eruption was very extensive, petechiæ of immense size and varying in color from bright red to dark brown, and extending from the abdomen over the chest and back. A severe diarrhea, alternating with dysentery, developed, and there were many profuse hemorrhages. Jaundice was marked. About the thirtieth day of the disease an acute lobar pneumonia developed. Nephritis, accompanied by cystitis, was one of the most persistent complications. Symptoms of uremia supervened, and marked general convulsions were noted. Suppression of urine, alternating with re-

tention, became most aggravating. The nervous symptoms were severe. Besides convulsions there were delirium and coma, subsultus tendinum, carphology, a marked ataxic condition, and tenderness and hyperesthesia along the spine. There was also extreme deafness. The gastric complications were so severe that no food could be taken by mouth. Herpes labialis was very marked and a facial erysipelas became most annoying. Perforation of the bowel occurred at the end of the third month, and a few days afterward the patient collapsed and died.

Medicine, Detroit, Mich.
July.

81 Nasal Headache. L. S. Somers, Philadelphia.
82 Ocular Headache. W. Reber, Philadelphia.
83 Headaches as a Symptom. William C. Dreis, Philadelphia.
84 *Treatment of High Pott's, with Description of a New Celluloid Head Support. C. P. Eikenbarry, Chicago.
85 Diseases of the Eye in Relation to the General Practitioner. W. H. Peck, Chicago.
86 Mastoiditis in Typhoid Patients. P. J. H. Farrell, Chicago.
87 Death from Hemorrhage from a Duodenal Ulcer Two Weeks After an Extensive Burn. G. McConnell, Philadelphia.
88 Case of Bilateral Hemstobium, with Plates, Showing the Ova of the Parasite. J. M. Anders and A. Callahan, Philadelphia.

84. **New Head Support in High Pott's Disease.**—The brace dtscribed by Eikenbarry is made of celluloid and stockinet, and is so constructed that it accurately fits the body, the neck and the posterior and lateral aspects of the head. By means of the webbing band passing around the forehead the head and neck are immobilized. There are no adjustments to make, nothing to get out of shape and destroy the fit and thus the effectiveness. The brace has also the advantage of being very light, the ordinary jacket weighing not more than a pound. If used for a dorsal or lumbar Pott's, where no headpiece is needed, the weight would not exceed ten or twelve ounces. The jacket is considerably less than a quarter of an inch thick, and is so strong that it easily bears a weight of 150 pounds. An accurately fitting plaster jacket is applied, including the neck and head. This is removed in the usual way by cutting down the front. From this mold a plaster model is cast. The plaster model is shellaced so as to prevent crumbling of the plaster. Over the model successive layers of the stockinet are drawn, each layer in turn being given a rather thick coat of the celluloid solution. Nine or ten layers are quite sufficient. None of the solution should penetrate to the inner side of the inner layer, or to the outer side of the outer layer, so as to have a perfectly smooth jacket inside and out. After applying the last layer, allow the model to set for twenty-four hours, and then trim the jacket before removing from the cast. Cut down the front in the usual way, bind the edges with chamois or cloth, and place a double row of hooks in front. The celluloid solution is made by dissolving chips of celluloid in acetone, about twenty-four hours being required for solution. The solution should have the consistency of cream.

Northwestern Lancet, Minneapolis.
July 15.

89 *Complicated Heart Case and Its Management. S. P. Rees, Minneapolis.
90 Is Physiologic Cupping of the Optic Disc, not Confined to the Center, Evidence of a Morbid Process? E. J. Brown, Minneapolis.
92 Case of Addison's Disease. G. D. Head, Minneapolis.

89. **Complicated Heart Case.**—Rees' patient gave a history of rheumatism which was followed by the development of aortic stenosis and regurgitation, a relative mitral insufficiency and sacular aneurism of the arch and descending portion of the aorta. The arch was very much hypertrophied, the apex being located in the sixth interspace in the midaxillary line. The pulsation in the vessels of the neck was prominent and jerky. A pronounced, continuous thrill was felt extending from the first to the fifth rib on the left of the sternum, and also along the right upper portion of the sternum in the suprasternal notch and in the vessels of the neck. The general health of the patient was good.

Detroit Medical Journal.
July.

93 Medical Supervision of Schools and the Progress of School Hygiene. C. G. Jenninga, Detroit.
94 Use of Sterile Water as a Local Anesthetic. L. J. Hunachman, Detroit.
95 *Personal Experience in the Employment of Mechanical Vibration in the Treatment of Rectal Diseases. W. L. Dickinson, Saginaw, Mich.

95.—See abstract in THE JOURNAL, July 8, 1905, page 129.

Southern Medicine and Surgery, Chattanooga, Tenn.
July.

96 *Radical Treatment of Certain Rectal Diseases Under Local Anesthesia. A. B. Cooke, Nashville, Tenn.
97 Case of Anemia of Pernicious Type Showing Marked and Rapid Improvement After the Administration of Liquor Potassi Arsenitis. P. A. Sheaff, Philadelphia.
98 Treatment of Neurasthenia. J. A. Hodges, Richmond, Va.
99 Static Electrical Treatment of Neurasthenia. R. W. Miller, Barton Heights, Va.

96.—Id., July 8, 1905, page 129.

Memphis Medical Monthly.
July.

100 Advanced Methods of Infant Feeding. B. C. McMahon, New York.
101 Formalin in the Treatment of Disease of the Rectum, Sigmoid and Colon. J. L. Jelks, Memphis.
102 Quinin in Pernicious Malaria. A. E. Cox, Helena, Ark.
103 Cerebral Forms of Pernicious Malaria. H. L. Sutherland, Rosedale, Miss.
104 Dystocia. D. M. Hall, Memphis.
105 Appendicitis; Necessity for Early Operation. O. L. Williamson, Marianna, Ark.
106 Treatment of Pulmonary Tuberculosis. G. R. Livermore, Memphis.
107 Connell Suture in End-to-End Anastomosis. B. Malone, Memphis.

Pacific Medical Journal, San Francisco.
July.

108 Medicolegal Consideration of Perverts and Inverts. R. W. Shufeldt, San Francisco.
109 Home Modification of Cow's Milk. C. A. Dukes, San Francisco, Cal.

Columbus Medical Journal.
July.

110 Diagnosis and Treatment of Diseases of the Heart. S. Loving, Columbus.
111 Address, Commencement Exercises of the Ohio Medical University. J. W. Wright, Columbus.
112 Cure of Consumption by Feeding the Patient with Subcutaneous Injections of Oil and Its Digestion by the White Globules of the Blood. T. B. Keyes, Chicago.

Mobile Medical and Surgical Journal.
June.

113 Gastroenterostomy. C. Wilson, Birmingham.
114 Puerperal Infection. E. M. Prince, Piper.
115 Puerperal Sepsis. W. W. Harper, Selma.
116 Responsibilities of a Physician in Obstetric Work and How He Should Meet Them. J. G. Palmer, Opelika.
117 Septicemia, Acute Septicopyemia and Recovery. G. H. Fonde, Mobile.

Vermont Medical Monthly, Burlington, Vt.
June 25.

118 Scarlatina vs. Rubella, etc. E. G. Roberts, Fair Haven.
119 Insomnia, with Special Reference to this Condition in Nervous and Mental Diseases. C. G. Andrews, Waterbury.
120 *Treatment of Diphtheria. J. W. Estabrook, Brandon.
121 Importance of Vital Statistics. J. W. Jackson, Barre.

Kentucky Medical Journal, Louisville, Ky.
July.

122 Extradural Hemorrhage. G. A. Hendon, Louisville.
125 Utility of Medicine. P. C. Sutphin, Canmer.
124 Tuberculosis—Medical. W. C. Ussery, Paris.
125 Past, Present, and a Glimpse of the Future of Medical Men and Societies of Fleming County. C. R. Garr, Flemingsburg.
126 Chronic Urethritis. J. W. Kincaid, Catlettsburg.
127 Progress of Diseases of the Eye, Ear, Nose and Throat. A. O. Pfingst, Louisville.
128 Progress in Diseases of Nervous System. B. F. Zimmerman, Louisville.

Fort Wayne Medical Journal-Magazine.
July.

129 Electricity in the Diagnosis of Nervous Diseases. G. W. McCaskey, Ft. Wayne.
130 Medical Expert. W. P. Breen, Ft. Wayne.
131 Parovarian Cyst: Sinistro-spiral Twist of Pedicle with Strangulation: Operation: Recovery. D. Van Sweringen, Ft. Wayne.

Medical Recorder, Shreveport, La.
July.

132 Pericardial Effusions. F. A. Jones, Memphis, Tenn.
133 Substitution of Mild for Stronger Alcoholic Beverages the True Remedy for Intemperance. C. H. Wilkinson, Galveston, Texas.
134 First Aids to the Injured. F. L. Barnes, Trinity, Texas.
135 Ankylchlepharon. Wm. L. Bullard, Columbus, Ga.
136 Bronchopneumonia. T. S. Ragland, Gilmer, Texas.

Journal of Experimental Medicine, New York.
July.

137 Bacteriology of Pertussis, with Special Reference to the Agglutination of the Patient's Blood. M. Wollstein, New York.
138 Presence of Certain Bodies in the Skin and Blister Fluid from Scarlet Fever and Measles. C. W. Field, New York.

139 Possibility of an Antibody for the Tetanophile Receptor of Erythrocytes: A Receptor Study. H. T. Ricketts, Chicago.
140 Comparative Study of Dysentery and Dysentery-like Organisms. J. C. Torrey, New York.

American Practitioner and News, Louisville, Ky.

July.

141 Treatment of Extrauterine Pregnancy (full-grown fetus removed). W. H. Wathen, Louisville.
142 Prostate Gland, with Special Consideration of the Treatment of Postoperative Incontinence. D. S. Wilson, Louisville.
143 Traumatic Neurasthenia. C. Weidner, Louisville.
144 Narcolepsy. S. J. Meyers, Louisville.
145 Calcium Oxalate Calculus—Mulberry Calculus. B. Robinson, Chicago.

Southern California Practitioner, Los Angeles, Cal.

July.

146 Origins of Medicine. W. Hutchinson, Portland, Ore.
147 True Nurse. J. R. Haynes, Los Angeles.
148 History of Medicine. J. P. Widney, Los Angeles.
149 Retrospect, Respect, and Prospect. L. J. Hull, Los Angeles.

Louisville Monthly Journal of Medicine and Surgery.

July.

150 Diagnosis and Treatment of Gastric Ulcer. C. jj. Lucas, Louisville.
151 Purpura. J. E. Hays, Louisville.
152 Mesenteric Occlusion.G. A. Hendon, Louisville.

Canadian Practitioner and Review, Toronto.

July.

153 Medical Treatment of Exophthalmic Goiter. R. D. Rudolf, Toronto.
154 Surgical Treatment of Exophthalmic Goiter. C. B. Shuttleworth, Toronto.
155 Duty of the Profession and State as Regards the Mental and Physical Care of Improperly Cared for Children. C. J. Hastings, Toronto.
156 Wards in General Hospitals for Acute Nervous and Mental Diseases. C. Meyers, Toronto.
157 Surgery of the Stomach from the Standpoint of the Clinician A. J. Ochsner, Chicago.

Oklahoma News-Journal.

July.

158 President's Address. Oklahoma Medical Society. E. N. Wright, Olney, Ind. Ter.
159 Radical Cure for Hernia. A. L. Blesh, Guthrie, Okla.
160 Insanity. W. W. Rucks, Guthrie, Okla.
161 Cocain in Minor Surgery. J. H. White, Muskogee, Ind. Ter.
162 Treatment of Rheumatism. W. F. Waugh, Chicago.
163 Measles and Some of Its Complications. M. A. Jones, Walters, O. T.
164 Backward Dislocation of Radius and Ulna of Long Standing. Treated by Resection, with Fairly Good Joint. W. M. Turner, Lawton, Okla.

Indiana Medical Journal, Indianapolis, Ind.

July.

166 Progressive Medicine. G. T. McCoy, Columbus, Ind.
167 Ophthalmology in Zurich and Munich. F. A. Morrison, Indianapolis.
168 Institutional Practice. H. Sharp, Jeffersonville, Ind.

Colorado Medicine, Denver.

July.

169 Koch's Tuberculin. Wm. J. Baird, Boulder.
170 Addison's Disease Without Pigmentation. J. N. Hall, Denver.

FOREIGN.

Titles marked with an asterisk (*) are abstracted below. Clinical lectures, single case reports and trials of new drugs and artificial foods are omitted unless of exceptional general interest.

British Medical Journal.

1 Medical Education—Past, Present and Future: President's Address, British Medical Association. G. C. Franklin.
2 Medicine, Present and Prospective: Address in Medicine; British Medical Association. H. Maudsley.
3 Ascending Currents in Mucous Canals and Gland Ducts, and Their Influence on Infection; Address in Surgery, British Medical Association. C. J. Bond.

The Lancet, London.

July 29.

4 Medical Education—Past, Present and Future: President's Address, British Medical Association. G. C. Franklin.
5 Medicine, Present and Prospective; Address in Medicine, British Medical Association. H. Maudsley.
6 Ascending Currents in Mucous Canals and Gland Ducts, and Their Influence on Infection; Address in Surgery, British Medical Association. C. J. Bond.
7 *Temporary Fixation of Testis to Thigh. C. B. Keetley.
8 Treatment of Acute Summer Diarrhea in Infants. J. A. Coutts.
9 Analysis of 300 Consecutive Gynecologic Laparotomies. A. H. N. Lewers.
10 *Tuberculous Disease of the Cecum. R. A. Stoney
11 *Rapid Estimation of the Amount of Sugar in Urine. R. T. Williamson.
12 Pulmonary Embolus, Occurring Shortly After Normal Labor. R. J. Waugh.

7. Fixation of Testes to Thigh.—Keetley reports on a series of twenty-five patients operated on for undescended testes, the plan of keeping down the testicle after operation being fixation to the thigh, a method devised by the author in 1894. The main incision is made over the inguinal canal and the external ring. Two other skin incisions are made in most cases, one about one and a quarter inches long at the bottom of the scrotum, and another of the same size in the upper and inner part of the thigh adjacent to the scrotal incision. Before cutting the scrotal incision a bed should be made with the finger in the scrotum to receive the testicle and the scrotal incision should divide all the structures down to this bed. Something, either a blunt instrument or a piece of gauze, should be passed through this scrotal aperture immediately, or its different layers will cease to be opposite one another. The thigh incision should expose the fascia lata. The testicles and the cord having been thoroughly freed from everything but the musculo-fibrous bands forming the gubernaculum, which are generally attached to the pillars of the external ring, especially the internal pillar, the gubernaculum is divided as far away as possible from the testicle. A pair of forceps is then passed from below upwards through the hole in the scrotum and the gubernaculum is seized by it and pulled right through the scrotum till it can be seen through the hole in the skin of the scrotum. At the same time the tunica vaginalis should also be pulled down into the scrotum, though it is not absolutely necessary to keep the testicle in its serous bag. The posterior borders of the apertures in the skin of the scrotum and thigh are next united by a continuous silkworm-gut suture left long at both ends. Now the gubernaculum testis is sutured with strong catgut to the fascia lata of the thigh; and, lastly, the original silkworm-gut suture is used to complete the union of the skin apertures in the scrotum and thigh to one another. The patient is sent to bed with his hip flexed, but soon straightens it out himself, thus gradually lengthening a short cord. For a dressing Keetley uses iodoform gauze wrung out in 1 in 2,000 bichlorid solution, the gauze being passed behind the scrotum as well as in front, and over the gauze, salicylate wool. The testicle is left attached to the thigh for five months. The operation is free from complications. The testicle remains permanently near the root of the scrotum.

10. Tuberculous Disease of Cecum.—Stoney's patient complained chiefly of pain in the left hip, most marked at night, which traveled down the back of the leg to the ankle. She also had some pains in the stomach, palpitation of the heart, giddiness, headache, and general weakness. Examination showed the hip to be normal, but there was much pain and tenderness on pressure over the spines of the first and second lumbar vertebræ. A large, somewhat irregular tumor was felt in the right iliac fossa. The abdomen was opened, and the cecum removed. Its walls were enormously thickened; the ileocecal valve was closed, and the opening of the appendix was reduced to a minute hole. Microscopic examination of the tissue disclosed a typical tuberculosis.

11. Rapid Estimation of Sugar in Urine.—Williamson describes a modification of Gerrard's method. The estimation can be made in a few minutes; only a small amount of urine is required, and the results are sufficiently accurate for most clinical work. The only apparatus required are a test-tube of ordinary size, a small narrow burette and a spirit lamp.

Indian Medical Gazette, Calcutta.

July.

13 *Dysentery in the Prisons of the Madras Presidency. C. F. Fearnside.
14 Dysentery as It Occurs in Jails with Regard to Etiology, Prophylaxis and Treatment. E. Jennings.
15 Relation of Oral Sepsis to Dysentery. F. O'Kinealy.
16 *Etiology of Dysentery, with Notes on Treatment. E. A. C. Matthews.
17 Dysentery: Its Varieties and Causes, Summarized and Criticised with a Note on Treatment and Prevention. A. G. Newell.
18 Use of Ipal in Dysentery. F. P. Mackie.
19 Drug Treatment of Dysentery. F. A. R. Newman.
20 Dysentery and Diarrhea Mortality in the Bombay Presidency. W. E. Jennings.
21 *Treatment of Dysentery. R. A. L. Deb.
22 Chemical Process of Sterilizing Water for Drinking Purposes for Use in the Field and at Home. V. B. Nesfield.

13. Dysentery in Prisons.—Fearnside reviews the medical history of the prisons in the Madras presidency since 1867 with reference to the rôle dysentery played in the vital statistics. He concludes as follows: 1. Dysentery in the Madras

prisons has accounted for the majority of deaths during the past forty years. 2. Many diseases reported as debility, anasarca, etc., and now not recognized as such, were in reality dysentery. 3. Scarcity of food and bad food predispose to dysentery both outside and inside the jails of the presidency. 4. Impure water has a similar effect, and the obsolete arrangement of the hand delivery of water should be abolished at an early date, taps and shower-baths being introduced. 5. Dysentery being an infectious disease should be treated in an extramural hospital specially built for the purpose. 6. The abolition of the association wards and the introduction of the cellular system is most essential and is an excellent preventive for the spread of any such disease since the person attacked is practicallly segregated, whereas in a barrack this is not so. 7. The abolition of mud banks and the introduction of plank beds, the former being septic and insanitary. 8. Patients who have suffered from dysentery should be kept separate for some time during convalescence as they are dangerous to the community within the prison. 9. The free use of anthelmintics in the treatment of prison dysentery since so many of these individuals harbor internal parasites. 10. Special care, during treatment, should be taken to prevent dysenteric patients receiving food other than that prescribed.

16. **Treatment of Dysentery.**—Matthews washes and dries in the sun the roots and lowest trunks of the ordinary garden geranium. Then he boils one quarter pound in a pint of milk for one hour, adding milk from time to time to make up the pint. This infusion is then strained through fine muslin, and two ounces are given every two hours until the disease is cured, which is usually in from two to six days. Treatment by this drug has several advantages: 1. In most cases, if not prolonged beyond five or six days, it is not necessary to give any other food, the dosage used giving the patient 1¼ pints of milk daily. 2. It is not nauseating; as a rule quickly relieves the nausea and pain in the abdomen, nor is it debilitating. 3. Its action seems to be entirely specific.

21. **Id.**—Deb relates his experience with *Ixora coccenia* in the treatment of acute bloody dysentery. The method of preparation employed was grinding the fresh root on a currystone with a small piece of long pepper and mixing the pulp so produced with water, or by preparing a tincture of 4 ozs. of the root to a pint of proof spirit. The dose of the root was from 10 to 30 grs. two or three times a day and the dose of the tincture from 3i to 3iss thrice a day with a few drops of tincture of opium according to the age and constitution and requirements of the patients. Tincture of ixora acts well with or without opium. Tincture of opium or long pepper adds to its efficacy, does no harm and acts promptly. According to Deb, it is not laxative or purgative, nor has it any ecbolic action like ipecac. It is suitable in all cases, especially in the hemorrhagic variety. The effect is noticeable within twenty-four hours after administration of the drug.

Therapie der Gegenwart, Berlin.

22 (XLVI, No. 4.) Erfahrung und Wissenschaft in der inneren Medizin (Experience and science in internal medicine). E. Romberg (Tübingen).

24 *Die Behandlung der Hyperacidität und der Hypersecretion des Magens (stomach). A. Albu (Berlin).

25 Ueber das Lecithin und Bromlecithin. P. Bergell and A. Braunstein.

26 *Nachweis freien Formaldehyds im Blute nach interner Anwendung (in blood after internal use). P. Rosenberg (Berlin.)

27 *Ueber die Heilung der Astasie-Abasie. D. Hammer (Budapest.)

28 Weitere Beobachtungen zur Salicylbehandlung (die intravenöse Injektion). F. Mendel. Id., Th. Bruggeh.

29 *Zur Diagnostik und Therapie der Tuberkulose der Mesenterialdrüsen im Kindesalter (of mesenteric glands in children). A. Hecht.

30 *Zur ambulanten Behandlung der Unterschenkelgeschwüre (ambulant treatment of leg ulcers). P. Leele.

31 *Ueber die Behandlung des Erysipels mit Ungt. Credé. W. Horn.

32 (XLVI, No. 5.) *Ueber den Einfluss der Aussentemperatur auf die Grösse der Zuckerausscheidung (influence of external temperature on amount of sugar excretion). H. Lüthje (Tübingen).

33 *Zur Verwendung von Wechselstrombädern in der Therapie der Herzkrankheiten (alternating currents in treatment of heart affections). August Laqueur (Berlin).

34 Ueber die Bedeutung der Radium-Emanation und ihre Anwendung (application). A. Braunstein (Moscow).

34½ Fall von therapeutischer Anwendung der Röntgen-Strahlen bei Morbus Addisonii. L. Golubinin (Moscow).

35 Behandlung der spastischen Obstipation. A. Albu (Berlin).

36 *Ueber Cyklotherapie der sexuellen Neurasthenie. P. Fürbringer (Berlin).

37 *Einfluss des Urotropins auf die Entstehung der skariatinösen Nierenentzündung (nephritis). K. Preisich (Budapest).

38 *Ueber Arbeitstherapie (occupation therapy). Otto Veraguth (Zürich).

39 Bemerkungen über Wärmebehandlung von rheumatischen Herzerkrankungen (heat in treatment of heart affections). A. Heermann (Posen).

40 Ein Wort zur Salicyltherapie rheumatischer Erkrankungen. Hans Naumann.

41 Zur Behandlung des Schnupfens der Säuglinge (coryza in infants). Hecht.

24. **Treatment of Hyperacidity.**—Albu recognizes the following forms of hyperchlorhydria: 1, A purely nervous disturbance of secretion; 2, that accompanying chlorosis; 3, an early stage of peptic ulcer; 4, the expression of a chronic hyperplastic gastritis. The treatment must be primarily dietetic and must not only exclude acid foods, gravies, spices, alcoholics and other irritating materials, but must also provide a detailed diet. The author recommends a vegetable diet in place of the alubuminous diet long considered indispensable, because although albumin combines with HCl, it also increases its secretion. The food must be well cooked and finely divided, if necessary, by putting through a sieve. Starchy foods are well tolerated if made of the finest meal from which the gluten has been practically removed. Fine wheat bread is to be preferred. While coarser vegetables are excluded, fine vegetable purées such as spinach or cauliflower are harmless. Albuminous foods may be taken with the exception of some fatty forms such as goose, pork, bacon, eel, herring, etc. The only fats of value are unsalted butter, milk and cream, and egg fat, because they are so easily emulsified. On account of the favorable action of fat he recommends from 1 to 2 tablespoonfuls of olive oil taken from one to two hours after the principal meals. Cane sugar is well borne by only a few of the patients. Milk, cream, cocoa, chocolate or weak tea may be given if they seem to agree with individuals. Small meals at frequent intervals are best in order to combine quickly the excessive secretion of acid. It is also advisable to eat a little before retiring or on waking, to prevent faintness. In stubborn cases stomach lavage is the best treatment, especially late in the evening, about three hours after the last meal, so as to give an undisturbed night's rest, or, if this is impracticable, in the morning on an empty stomach. The author recommends lavage with water holding in suspension a mixture of magnesium and sodium bicarbonate. To restrain the production of acid he recommends a combination of alkali and belladonna. For constipation he uses vegetable diet, oil, enemata, and an occasional cathartic. Hypersecretion, he states, is usually a complication of gastrectasia, atony, ulcer, hyperchlorhydria, or an independent secretion continuous in Reichmann's disease or intermittent, dependent on disease of the central nervous system. The treatment should depend on the underlying affection. Liquids should be limited in amount. Food should be administered in the form of mush, gruel or purée in small and frequent meals. The milk may be boiled down to half its volume in order to get rid of the useless water, which is even harmful on account of its weight. The choice of nourishment should be exactly like that in hyperchlorhydria, since the latter is always an accompaniment of hypersecretion. Lavage late in the evening serves to remove the excess of secretion and care should be taken to remove all of the fluid introduced.

26. **Free Formaldehyd in the Blood After Internal Use.**—Rosenberg presents experimental evidence that free formaldehyd may exist in the blood to the extent of 0.0775 per cent. after the administration of tablet containing the drug in combination with milk sugar. It is excreted in the urine and in the milk. This quantity, he believes, can act as a disinfectant.

27. **Astasia-Abasia.**—Hammer treats hysterical astasia-abasia (inability to stand or walk) by seclusion in the hospital ward by means of screens that prevent the patient from seeing his neighbors, although he can hear conversation and know what is going on. This fact intensifies the patient's desire to get well and facilitates the other treatment. Suggestion is best carried out in the waking state, as experience has shown this to be more effective than hypnosis. The ex-

ercises are used to suggest a strengthening of the limbs, especially the feet, and emphasis is laid on every sign of improvement. A generous diet, largely milk, is administered. By this method five patients were permanently cured.

29. **Tuberculosis of Mesenteric Glands in Children.**—Hecht relies for diagnosis of tuberculosis of the mesenteric glands on the history, on the tenderness of the abdomen, on the abdominal pains present on both sides, and on the occasional presence of a palpable tumor or tumors. The feces often show the presence of mucus, blood and tubercle bacilli in cases in which there is no diarrhea. The prognosis is by no means hopeless, but treatment must be prolonged, lasting months or even years. If practicable, sea bathing is advisable.

30. **Varicose Ulcers.**—Loele advises the ambulant treatment of leg ulcers because the patients, who usually belong to the lower classes, will not lie abed or enter a hospital while the ulcer is of a size to be easily curable. He uses a modification of Jessner's method, which consists of cleansing the ulcer and its neighborhood with benzine, dusting it with an antiseptic powder and covering it with oiled silk. A roller bandage of cotton 20 cm. wide is then applied over the whole lower third of the leg, including the ankle and the ulcer. Over this an elastic bandage is carefully applied. If applied with sufficient firmness a new dressing need not be applied oftener than once a week. With this treatment an ulcer the size of a dollar should heal in about six weeks.

31. **Treatment of Erysipelas with Crede's Ointment.**—In cases of erysipelas at points where compression by adhesive plaster or collodion can not be applied, as on the neck or chest, Born recommends applying Credé's ointment around the affected area, rubbing the ointment into the tissues with the fingers. The rubbing must be continued on the same part of the skin for thirty minutes, and must be carefully done to avoid hurting the patient. It is repeated on three successive days, and when properly done has been uniformly successful in limiting the spread of the disease. It acts by introducing into the subcutaneous connective tissue enough silver to act as a bactericide in this encircling zone.

32. **External Temperature in Diabetes.**—According to Lüthje's experiments, external cold increases the decomposition of albumin and excretion of sugar in diabetic dogs, with retention of nitrogen. The external temperature should be more carefully regarded in experimental research in diabetes, and failure to do this probably explains some of the discrepancies in the published results. Observations on 4 diabetics from a month to six weeks showed analogous fluctuations in the excretion of sugar, the amount increasing at low temperatures (15 C.) and diminishing at high temperatures. The increase of tolerance thus obtained may be of the greatest practical importance.

33. **Alternating Currents in Treatment of Heart Affections.**—Laqueur has experimented to determine the action of alternating currents (sinusoidal) on the size of the heart, with the result that, with the exception of a case of neurasthenia of the heart complicated with slight dilatation, alternating currents brought about no immediate change in the size of the heart. Permanent diminution in size occurs only occasionally, when dilatation is caused by relaxation, but not when compensating dilatation in case of valvular defect is combined with hypertrophy. Increase of blood pressure is usual but not constant. In contrast to other authors, Laqueur does not consider alternating currents necessarily contraindicated in heart diseases with increased blood pressure. Slowing of the pulse is still less constant, and is probably attributable to the effect of rest. Subjective symptoms, however, are often much improved. Relief of dyspepsia, increase of appetite and better sleep are noticed. The author agrees with Lippert that the chief action of sinusoidal currents consists in the increase of blood pressure, often accompanied by diminution of frequency of the pulse in the energetic stimulation of metabolism, promotion of sleep and increase of the motor energy of the heart and of the other muscles of the body. The indications for this treatment are weakness with dilatation of the heart caused by relaxation of the heart muscle, fatty heart, idiopathic hypertrophy of the heart, and also incipient disease of the myocardium and incipient arteriosclerosis. The author does not agree with Zimmermann. In pronounced arteriosclerosis with increased blood pressure the application of this current is contraindicated as well as in aneurism. For these conditions carbonated baths are preferable. General neurasthenics are not improved, but cases of neurasthenic cardiac weakness without marked general symptoms do well. It is better than Faradism because of its greater uniformity of current. The author prefers the full bath to local applications, but describes an apparatus for local application which he has found to exert a good influence on the heart. The action of alternating currents is twofold: On the one hand the current causes an irritation of the sensory nerves of the skin and by reflex action elicits better heart innervation (increase of blood pressure, more powerful contraction of the heart, and slowing of the pulse). On the other hand, the peculiar muscular contractions which the current elicits exert a certain favorable influence on the circulation. The alternating current baths fail, however, to dilate the blood vessels like the carbonated baths. A current bath is always more of a heart-stimulating than a heart-sparing procedure.

35. **Spastic Constipation.**—Albu emphasizes the fact that the treatment of spastic constipation must be based on an exact knowledge of the character of the affection and of the condition of the patient. As spasm is developed on an atonic basis, everything favoring its development must be avoided, especially massage and cathartics. Treatment must be directed to allaying irritation and should include warm, hot or carbonated baths, hot abdominal compresses, warm oil enemata (250 c.cm. every evening), atropin or belladonna suppositories, and a generous diet, largely vegetable, free from all substances (hulls, seeds, etc.) that might irritate the intestine, prepared so as to be capable of very fine subdivision (bread from very fine wheat flour, vegetables in form of purée, cooked fruits, soups, milk, etc.). Alcohol, spices, cabbage, cucumbers, lettuce, cheese, etc., should be avoided. A further important measure is the daily introduction of well oiled bougies for from 5 to 10 cm. into the rectum, allowing them to remain from ten to fifteen minutes. Rest in bed is to be recommended only in case of much reduced patients, as it tends to increase the atony of the bowel. A Weir Mitchell cure in some cases, however, gives remarkably good results.

36. **The Bicycle in Treatment of Sexual Neurasthenia.**—Fürbinger recommends the bicycle as a healthful exercise in the open air which insures good circulation and sufficient use of the muscles without exhaustion, and rests the brain and nervous system while using the organs of special sense. In sexual neurasthenia impotentce is likely to be favorably influenced by the general tonic influence of the sport. Exceptions occur which must be individually treated. Seminal losses are variably affected. A large number of patients are made worse, and these should avoid the wheel. Others are favorably influenced, and in the majority of cases no fear need be entertained that cyclotherapy will originate seminal losses. The prescription of this form of exercise should be in the hands of a physician who is a bicycler himself, and can give suitable advice as to the length of ride, kind of saddle, etc.

37. **Hexamethylenamin for Scarlatinal Nephritis.**—Preisich has tested the method of Widowitz, which consists in the administration of from 0.05 gm. to 0.5 gm. of hexamethylenamin and in 9.16 per cent. of those receiving the drug. The weeks of scarlet fever, with a view to the prevention of nephritis. He administered the drug in 600 cases and compares the results with those observed in 600 other cases similarly treated, except that they did not receive the drug. Nephritis occurred in 13.6 per cent. of the cases without hexamethylenamin and in 9.16 per cent. of those receiving the drug. The course of nephritis was more favorable with the hexamethylenamin than without it. He estimates that under favorable circumstances it is capable of reducing the occurrence of nephritis in scarlet fever by 56 per cent.

38. **Work as a Therapeutic Measure.**—Veraguth emphasizes the psychical origin of neuroses in general and the trend of neurotherapy toward a pure psychotherapy. Of the various forms of psychotherapy, aside from a certain element of confidence which must enter into all treatment, the so-called

"logical" method depends very largely on the physician's personality and the authority which he derives from experience and reputation. The influence of this method is limited by the short time during which the physician can impress himself on the individual patient. In prescribed occupation, the psychotherapist has a powerful aid in controling the mental influences which operate on the patient. Veraguth divides the various occupations which have therapeutic value into the following classes: 1. Work expending muscular energy, of a productive character, such as cabinet-making or gardening. 2. Work of an intellectual character, such as art, literature or science. 3. Work expending muscular energy but unproductive, such as the different sports. 4. Varied employment. As an exercise in art, drawing has obvious advantages as securing better observation and furnishing a pleasant and unusual exercise of the power of expression. Plaster or clay modeling and wood carving have similar advantages. In literary work, productive writing is more efficient than reading. A good suggestion for elderly patients is the recording of their experiences for the benefit of their friends or descendants. Neurasthenia produced by overwork at a monotonous occupation offers the best field for successful occupation therapy. Occupation therapy does not replace the other forms of psychotherapy, especially suggestion, but helps this as well as every other rational treatment. Systematic indications for different kinds of occupation are adaptability to the nature and stage of the disease and to the idiosyncracies of the patients. The greater the variety of work afforded the better. The patient must not be forced but persuaded to work, if he does not himself comprehend its sanitary value. The physician must directly or indirectly control the patient so as to determine exactly the duration of work and rest. He must exhibit a decided personal interest in the work of the patient. Occupation therapy may act by directing the activity of the senses, as in drawing; by physical exercise, as in fencing; by its psychical relief, as in writing memoirs; by strengthening the will; by overcoming the prejudice against work, and especially by diverting the mind from a tendency to become self-centered.

Deutsche medicinische Wochenschrift, Berlin and Leipsic.

42 (XXXI, No. 25.) * Die Behandlung des Diabetes mellitus. B. Naunyn.
43 Observations on Epidemic Cerebrospinal Meningitis.—Beobachtungen bei Genickstarre. v. Drigalski.
44 Fall von operierter Geschwulst des Rückenmarks (tumor in spinal cord). J. Kron.
45 Nerve Grafting in Spinal Paralysis in Children.—Zur Behandlung der spinalen Kinderlähmung durch Nervenpfropfung. Hackenbruch.
46 Zur Therapie des Scharlachs (scarlet fever). R. Quest.
47 Zur Diagnose und Therapie der chronischen Perityphlitis. A. Albu.
48 Zur Färbung der Spirochæte pallida Schaudinn (improved stain). K. Reitmann.
49 Forensic Examination of Semen Spots.—Zur Untersuchung soenschlicher Samenflecke für gerichtliche Zwecke. Wederhake.
50 The "Semi-responsibles."—Die sogenannten "Minderwertigen" im Lichte des Plotznerser Prozesses. W. J. Koenig.

42. **Diabetes.**—Naunyn remarks that diabetes mellitus generally develops in patients with a congenital predisposition, frequently inherited. Cases in which it affects perfectly normal individuals are very rare. The consequence is that not much can be expected from treatment after the disease is once well established in the predisposed patients. It may be improved, but as the tendency persists it is impossible to cure it completely. It is also important to be on the lookout for the initial manifestations in individuals known to be predisposed to this disease. In every disturbance of health in a member of a family in which cases of diabetes have occurred, the urine should be tested as a routine measure, especially in persons inclined to be corpulent, children in particular and, above all, in individuals in whom a tendency to obesity develops suddenly. Even if there be no signs of diabetes, such persons should be supervised with especial care, and physical and intellectual work should be fostered and overeating forbidden. Sweets and beer should be forbidden. Milk, green vegetables and fruits (except the very sweet ones) should be recommended in moderation. Naunyn gives rules for regulating the diet after diabetes is once established, guiding it by the tolerance of the patient determined by continuous oversight of the urine. He has found the occasional interposition of a "hunger day" very useful, allowing nothing but tea and bouillon for twenty-four hours. The effect is remarkable sometimes, but not until the sugar has been reduced to a minimum of a few grams. It then not only banishes the sugar altogether, but raises the limits of tolerance thereafter. A course of dietetic treatment according to his rules requires about two months. Whether such a course can be successfully conducted at home depends on the housewife. In testing the urine he always adds Gerhardt's iron chlorid test for acetic acid. If the reaction is positive acidosis exists, and from 10 to 15 gm. of sodium bicarbonate should be given daily without interfering with the other remedial measures. If the positive reaction grows more and more pronounced, the bicarbonate should be pushed, the patient limited to fruits, milk and bread, and the continuance of the treatment entrusted to a specialist. In regard to special "cures," plums, milk, potato and oatmeal cures, he thinks that their success is due to the fact that so large a proportion of the substance ingested passes through the system unutilized. The "cure" is practically an underfeeding. The apparent tolerance is merely that comparatively little of the diet is assimilated.

Münchener medizinische Wochenschrift.

51 (LII, No. 24.) *Ueber das Vorkommen der Spirochæte pallida bei Syphilis. C. Fraenkel.
52 Physiologic Importance of Great Omentum.—Die phys. Bedeutung des grossen Netzes. L. Heusner.
53 *Die Kastration beim Mamma-Karzinom. E. Michels.
54 Manual Transformation of Face and Frontal Presentation. Zur manuellen Umwandlung der Gesichts- und Stirnlagen. H. Hellendall.
55 Die chronische Oöphoritis. A. Theilhaber.
56 Ueber menstruellen Ikterus. L. Metzger.
57 Tetanie im Puerperium. Gottschalk.
58 Statistischer Beitrag zur gegenwartigen Genickstarreepidemie (cerebrospinal meningitis). Eggebrecht.
59 Erfahrungen mit Polano's Brutapparat (incubator). Gutbrod.
60 Eine Verbesserung der Milchpumpe (improved breast pump). M. Forest.
61 *Apparatus for Lavage of Intestine in Children.—Ein einfacher Apparat zur Darmspülung in der kinderärztlichen Sprechstunde. E. Fromm.
62 Zur Trachom-Frage. A. Peters.
63 Ueber die agglutinierende Wirkung des Serums von Typhus-Kranken auf Paratyphus-Bazillen, nebst Bemerkungen über makroskopische und mikroskopische Serodiagnostik. Korte and Sternberg.
64 Epidemic of Acute, Recurring Polymositis.—Akute residivierende Polymyositis. K. Sick. (Commenced in No. 23.)

51. **Spirochetes in Syphilis.**—Fraenkel's findings corroborated those of the discoverers of the *Spirochæte pallida*. He found it constantly in syphilitic lesions, but never in those of other nature.

53. **Castration in Mammary Cancer.**—Michels records his favorable experiences with oöphorectomy in mammary cancer. He reports three cases in which this operation was performed with good results. The mortality of operations for removal of sound ovaries is small. In 102 cases of which he has cognizance only 6 of the patients succumbed, 3 from exhaustion, 2 from embolism of the lungs and 1 in a maniacal attack.

61. **Apparatus for Lavage of Intestines in Children.**—A tray with open slats is placed slanting in the child's bathtub, which is supplied with a drain tube and faucet at the foot. Fromm has found this arrangement very convenient for office work. In case he has to use the tub again before there is a chance to clean it, a disinfectant solution is poured over the sides of the tub and the tray, and towels laid over the sides and tray protect the next child against infection from his predecessors.

Jahrbuch f. Kinderheilkunde, Berlin.

Last indexed page 143.

65 *(CXI, No. 4.) Ueber die Mortalität der Diphtherie und des Croup in den grösseren Städten Ungarns mit Rücksicht auf die Serum-Therapie (in Hungarian cities). J. Erdös.
66 Zur chirurgischen Behandlung der Noma. C. Springer.
67 Zur Klinik und Pathogenese des nomatösen Brandes (gangrene). H. Brüning.
68 Measles and "Schweissfriesel" a Special Eruptive Disease.—Ueber Rötteln und Schweissfriesel. Hoche.
69 (Nos. 5-6.) "Acid Intoxication" in Chronic Gastrointestinal Affections in Infants.—Zur Frage der "Säurevergiftung" beim chronisch magendarmkranken Säugling. M. Pfaundler.
70 Zur Kenntnis der cerebralen Diplegie des Kindesalters und der Mikrocephalie. J. Ibrahim.
71 *Ueber Butter-Milch. G. v. Massanek (Budapest).
72 Icterus infectiosus epidemicus im Kindesalter (in children). H. Flesch.

73 Importance of Bacteriologic Examination for Medical Practice.—Bedeutung der bakt. Diphtherie-Untersuchung für die ärztliche Praxis. J. Schoedel.
74 *Zur Aetiologie und Pathogenese der Chorea Minor. B. N. Czerno-Schwarz and R. O. Lunz (Moscow).
75 *Markzellen (Myelozyten) im kindlichen Blute (marrow cells in children's blood). T. Zelenski and T. Cybulski (Cracow).
76 Zur Behandlung skrophulöser Kinder (scrofulous children). A. Keller (Breslau).

71. Buttermilk in Infant Feeding.—Massanek has been much pleased with the results of buttermilk in feeding the sick infants in his service. All thrived on it remarkably well, as also healthy children. He gives the details of study of the metabolism in a number of the children taking the buttermilk.

74. Chorea Minor.—The conclusions from a study of 96 cases are that there is evidently a close connection between acute articular rheumatism, endocarditis and chorea. The combination was apparent in more than 62 per cent. of the cases described. The attack of rheumatism may run an almost latent course, but its effects on the heart become manifest later.

75. Marrow Cells in Blood of Children.—The conclusions of Zelenski's work are, in effect, that the presence of marrow cells in the blood of children is not so significant as formerly imagined. They do not have the same diagnostic importance in children as in adults. When nucleated red corpuscles are found in large numbers, especially megaloblasts and giant forms, this indicates a morbid process in the blood at any age, although experience has failed to demonstrate the existence of the so-called infantile pseudoleukemic anemia as a separate entity.

Gazzetta degli Ospedali, Milan.

Last indexed page 583.

77 (XXVI, No. 61.) Flemmone ligneo postoperativo (woody phlegmon). E. Giuliano.
78 Recommendation of Claudius' Catgut.—Sulla sterilizzazione del catgut. R. Gennaro.
79 *Cura delle ulcere varicose e delle superfici granulanti col metodo di Scott Schley. L. Marchetti.
80 New Methods of Obtaining the Specific Sensitizer in Typhoid Serum.—Nuovi metodi di ricerca della sensibilizzatrice specifica nel siero del tifosi e nel siero degli animali immunizzati contro il bacillo di Eberth. C. Quadrone.
81 (No. 64.) *Germi latenti(stafilococco piogeni albo) nel circolo sanguigno dell' uomo (latent germs in blood). L. Panichi.
82 *Psychic Disturbances and Ear Affections.—Disturbi psichici ed otopatie. V. Grazzi.
83 (No. 67.) Tuberculoma ulcerato della lingua. G. Ghedini.
84 Linfoide eosinofile nel sangue e nello sputo dei tubercolosi. A. Rizzoli.
85 Foreign Bodies in Ear.—Corpi estranei nell orecchio. A. De Blasi.
86 Sopra alcune reazioni colorate delle alfeidi formica ed acetica, dell' acetone e dei benzochinone, e sulle loro probabili applicazione agli studii medicin (color reactions of formaldehyd, etc.) E. Pittarelli.
87 (No. 66.) Mezzo semplicissimo per sterilizzare in qualche minuto ogni catetere (to sterilize a catheter in a few minutes). G. Ingianni.
88 (No. 70.) Rapide diminuzioni dei limiti plessimetrici nella pericardite siero-fibrinoda acuta (rapid reduction of plessimeter findings). G. Ferrari.
89 Puntura esplorativa e massagio nella cura dell' idrocele nel bambini (hydrocele in children). U. A. Betti.
90 Leucemie e sarcomatosi. G. Ghedini.
91 *Semplificazione della tecnica delle injesioni endovenose di ossigeno (oxygen intravenously). M. Sciallero.

79. Boric Acid Treatment of Varicose Ulcers.—Marchetti has been much gratified by the success of the Scott Schley method of treating varicose ulcers and granulating surfaces, which he has used in 23 cases. Finely pulverized boric acid is scattered copiously over the surface, covered with four thicknesses of fine rubber tissue, extending from 2 to 5 cm. beyond the lesion, and fastened in place with adhesive plaster. Gauze is applied over this and the dressings are left undisturbed for from five days to a week or more. All the extensive lesions healed rapidly, the longest time required being twenty-seven days, in one case of extensive septic ulceration of the leg, with general symptoms. The average for the other cases was from fifteen to twenty days. These results in dispensary patients were truly surprising as such cases are apt to be tedious even with intelligent co-operation on the part of the patient, which can not always be anticipated.

81. Staphylococci Latent in the Blood.—Panichi reports two cases from Tizzoni's clinic at Bologna in which a furuncle or phlegmon was followed by the constant finding of the *Staphylococcus pyogenes albus* in the blood during several weeks and months after the individuals were apparently in the best of health. One patient was a gardener of 44 and the other a girl of 16. The latter presented a subcutaneous abscess in the nipple region a few weeks after a diffuse eczema, during which the staphylococcus first had been noted in the blood.

82. Mental Disturbances and Ear Affections.—Grazzi read this communication before the Fifth International Congress of Psychology last April at Rome. He has had occasion to observe a number of cases in which mental disturbances occurred in the course of ear affections. Diffuse otosclerosis seems to be most dangerous in this respect. Treatment of the ear affection is liable to improve or to cure the other disturbances, hence the necessity for frequent inspection of the ear by otologists in cases of neuropathy in which the physician has reason to suspect the existence of some ear trouble.

87. Minute Sterilization of Catheter.—Ingianni puts the catheter in a urine glass test-tube filled with a saturated solution of sodium sulphate. The tube is lengthened by slipping over it a rubber tube about 30 cm. long by 15 mm. in circumference. A cork with a hole through it and a groove along the side is used to plug the top of the rubber tube. The tube is then held over the flame of an alcohol lamp, and as the water boils in the test-tube the catheter is thoroughly sterilized in a minute or so. The catheter need not extend down to the bottom of the straight test-tube, and the pliant rubber fits its curve without trouble. Tests of catheters thus sterilized by the boiling sodium sulphate and the steam have shown that the results are perfect. If metal catheters are to be sterilized water alone or with sodium carbonate is preferable.

91. Intravenous Injection of Oxygen.—Sciallero describes with illustrations a simplified technic for injecting oxygen into the veins. The procedure is so simple that it brings within the reach of everyone, he says, this heroic therapeutic measure which promises good results.

Archiv f. Verdauungs-Krankheiten, Berlin.

Last indexed XLIV, page 588.

92 (XI, No. 1.) *Zur Frage der chemischen Funktionsprüfung des Magens (chemical tests of stomach functions). B. Wagner (Rostock).
93 *Zur Lehre von den Infusorien, die als Parasiten im Verdauungskanale des Menschen vorkommen; ein Fall von Balantidium coli im Darm des Menschen (infusoria in human digestive tract). I. I. Kosiowsky (St. Petersburg).
94 *Ueber Ankylostomiasis duodenalis in Japan. Z. Inouye.
95 *Ueber Albumosurie bei Magen-Darmerkrankungen speziell Carcinomen (diseases of stomach and intestine). H. Ury and E. Ehrenthal (Berlin).
96 (No. 2.) *Zur Pathogenese der Kolik. H. Nothnagel.
97 *Gefährliche Komplikationen bei Hungerkur des peptischen Magengeschwürs (gastric ulcer). N. Reichmann (Warsaw).
98 Ueber die Bindung des Chlors in der Magenschleimhaut (binding of chlorin in gastric mucosa). F. Dauwe (Gand).
99 Einfache Methoden zur quantitativen Bestimmung der vom Magen ausgeschiedenen Enzyme (estimation of ferments secreted by the stomach). H. Illoway (New York).
100 Fall von Coecum volvulus. M. Buch (Helsingfors).

92. Chemical Tests of Stomach Functions.—Wagner gives the results of examination of the stomach contents in 430 cases, considered in four classes: 1, Diseases in general; 2, organic diseases of stomach; 3, functional stomach diseases; 4, blood diseases. A larger number of men than women were affected with hyperchlorhydria. The large total of cases in which acidity may be classed as normal is especially important, as it amounted to fully one-half. His investigation of patients with ulcer showed 54 per cent. women and 46 per cent. men. Contrary to the rule of Riegel, Wagner found that hyperchlorhydria was present in less than half of the cases of ulcer. Nearly 25 per cent. of all the patients with hyperchlorhydria were affected with ulcer. For a certain diagnosis of ulcer it is sometimes necessary to introduce the stomach tube, and, if done carefully, this can be accomplished with little danger. In order to determine whether free blood be present in the stomach, a test lavage is given by pouring 100 c.cm. of water down the tube as soon as it reaches the middle of the esophagus, the tube being then pushed in without fear and the water removed. Occasionally retching occurs, with a flow of blood, in which case the tube should be immediately removed and the diagnosis considered established. This accident seldom gives rise to any serious consequences. The guaiac test for blood is not only somewhat too delicate for clinical use, but also gives the same results when pus, bile or saliva are mixed with the fluid to be tested, as is often the

case with stomach contents. In spite of this it is a great help in the diagnosis of gastric ulcer and of carcinoma of the esophagus or cardiostenosis, when the stomach contents can not be obtained, or in controlling the progress of healing in case of ulcer. The author found no free HCl in 90 per cent. of his cases of carcinoma. Discovery of blood in the feces of carcinoma patients seems to be of little value, since it was found in but two out of six cases in which the diagnosis of cancer had been definitely established by other means. He divides achylia gastrica into simple and complex, the latter occurring in patients with pernicious anemia. Another blood disease commonly associated with hyperacidity is chlorosis, which is accompanied by an abnormal appetite. Five out of 14 cases were found to have hyperchlorhydria. Wagner concludes that it is difficult to fix a rule for the condition of the stomach contents in certain diseases, but that there are general characteristics which are an important help in diagnosis. The cases in which the proportions of acid are characteristic are few and comprise only organic stomach diseases, namely, ulcer and carcinoma, and blood diseases.

93. **Infusoria as Parasites in Human Digestive Canal.**—Koslowsky mentions 105 cases of *Balantidium coli*, and believes that more occur than are generally recognized owing to the facts that helminthiasis from the feces are so seldom examined, that the parasites decompose readily, and that numbers of cases have not been published. Reports show that this condition usually appears as a complication, especially of intestinal diseases. At the autopsy in 30 and on microscopic examination of the tissues in 9 cases, the pathologic changes were most pronounced in, and generally confined to, the rectum and large intestines. The process was generally limited to catarrh. Long continuance of the affection may cause ulcers reaching through the mucous membrane to the submucosa or muscularis; by confluence these ulcers may attain a diameter of 3 to 4 cm. The parasite was found in all layers of the mucous membrane, even in the lumen of the small veins, but most frequently in the submucosa. His experiments on rabbits and guinea-pigs showed no evidence of infection and pigs could not be infected. He describes his methods of fixing and staining, and the development, degeneration and death of the *Balantidium coli*. He states that it can live in the dead body from ten to seventy-two hours. The embryos may be mistaken for the eggs of *Bothriocephalus latus*. He also mentions two other kinds of ciliated parasites which have been found in the human intestine.

94. **Ankylostomiasis in Japan.**—Inouye states that ankylostomiasis is found in all parts of Japan, most commonly among farmers, since human excrements are used in fertilizing and insufficient care is taken in preparing food. More men than women are affected. The malady begins gradually and may be latent as long as three months. Its severity depends on the number of worms, their length of stay in the intestine, and the resisting power of the patient. The victims are at first affected with vague digestive disturbances, become pale, complain of palpitations, lack of breath, dropsy, anemia and finally die. The local symptoms are pressure and fullness in the epigastrium, intestinal pain, heartburn, nausea and vomiting. The author found no blood or worms in the vomitus, stomatitis is rare, there is increase of saliva, foul breath, solid stools and occasionally diarrhea. The eggs found in the stools by microscopic examination have bright shells and brownish grooved kernels. He does not regard Charcot's crystals in the feces as pathognomonic for ankylostomiasis since they occur with other parasites and are not always present with this worm. The appetite is generally good, but parorexia is often present, the patient wanting peculiar things to eat (pepper, vinegar, raw rice, charcoal, tobacco, plaster or nails). Geophagia was observed only once. Parorexia is proportionate to the grade of anemia. The author finds, in contradistinction to Tanaka, that when the affection is complicated with carcinoma there is less free HCl and the lactic acid reaction is very distinct. Liver enlargement is frequent. It is difficult to decide whether splenic enlargement is due to the worms or to complicating disease. Inouye attributes a diagnostic significance to eosinophilia. He notes the changes in the nails as characteristic. They become yellowish, brittle, parchment-like and tear easily lengthwise. The surface shows wavy projections and furrows and the nails curve backward. These changes disappear with the expulsion of the worm, and they are proportional to the anemia. Various nervous symptoms and even epileptic attacks are liable to occur. He found the knee-jerk normal. He holds that the anemia can not be explained simply as a result of hemorrhage, and with many other Japanese authors adheres to the toxic theory of anemia. The following precautions should be taken for prophylaxis: Disinfection of feces with milk of lime, careful disinfection of materials used as fertilizers, avoidance of raw vegetables in the diet or of eating with soiled hands in the fields, or drinking polluted water. Two remedies are recommended for the expulsion of the worm: Oil of male fern and thymol. The first should be administered with the following precautions. The dose must not exceed 5 gm.; castor oil must not be given with the fern oil, and the latter should not be given for several days in succession. Ankylostomiasis must always be treated in a hospital, and as soon as the patient complains of pain in the eyes, disturbances of vision or dilatation of the pupils, the treatment must be suspended. He thinks that thymol is to be preferred and recommends it in doses of from 2 to 3 gm. (grs. xxx to xlv) on an empty stomach, followed after some hours by a cathartic (castor oil); this treatment is repeated daily until all worms have been expelled. Symptoms of poisoning which occasionally arise usually disappear when the treatment is temporarily suspended, fail to reappear when it is recommenced. The thymol treatment is often somewhat dangerous in advanced cases because of the temporary increase of debility.

95. **Albumosuria.**—Ury and Lilienthal have examined 40 cases of carcinoma for albumosuria and conclude as follows: 1. Two-thirds of all cases of carcinoma show a positive albumose reaction in the urine, although it varies greatly at different times in the same case. 2. Albumosuria is occasionally found in rare cases of benign stomach or intestinal affections. 3. Maixner's theory that albumose is generated in the intestines seems quite improbable. It probably originates in the tissues. Albumosuria may be absent, however, in far advanced, decomposing cases of carcinoma. 4. The discovery of albumose in the urine has no positive significance for diagnosis of cancer of the intestinal tract, but repeated positive results may confirm the presence of malignant disease. 5. Albumosuria frequently appears to be present in febrile cases.

96. **Pathogenesis of Colic.**—Nothnagel discusses the views of Meltzer, Wilms and Lennander in regard to colic, and concludes that the original term colic, should be retained for intestinal pain of a special kind in relation to its pathogenesis and clincal form. This pain arises in the intestine itself. A tetanic contraction of the intestinal musculature is effective as a primary factor in its origin. This contraction leads to ischemia, or even anemia, of the intestinal wall, by pressure on the blood vessels and thus produces the pain. How far this theory of colic may be applied to other organs provided with smooth muscular fiber is not discussed, but the author believes it to be true in regard to colic of the bladder.

97. **Dangerous Complications in Starvation Treatment of Peptic Ulcer.**—Reichmann calls attention to two dangerous complications in the treatment of peptic gastric ulcer: Loss of strength and disturbance of the heart's action which may necessitate abandonment of the treatment, and purulent parotitis, of which he has seen three cases during twelve years, one of which terminated fatally. The probable cause is the entrance of bacteria from the mouth into the parotid ducts. This is due to lack of mastication, which prevents the flow of saliva and cleansing of the mucous membrane and ducts. This complication can be prevented by applying a 4 per cent. solution of boric acid with a swab to the surface of the mucous membrane, especially that of the cheeks. The starvation treatment need not be abandoned because of these dangers, as with care these complications can be avoided.

Hospitalstidende, Copenhagen.

Last indexed XLIV, page 822.

101 (XLVIII, No. 12.) *Treatment of Diplo-bacillus Conjunctivitis.—Diplobackonjunktivitis og dens Behandling. K. K. K. Lundsgaard.

102 (No. 13.) Improved Pan-shaped Spatula.—En vifteformet Laparotomie-spatel. P. K. Faber. (Rovsing's clinic, Copenhagen).
103 Alcohol as Cause of Increase of Crime and Mental Affections.—Om Alkohol som Aarsag til Forbrydelse og Sindssygdom. F. Hallager.
104 (No. 15.) *Milk Diet in Chronic Tropical Diarrhea. Maelkediaet ved Kron. Tropediarré "Sprue."
105 (Nos. 16-17.) *Research on Infantile Marasmus.—Undersögelse over Borneatrofien. C. E. Bloch.
106 (Nos. 18-20.) *Om kronisk Parotitis. A. Lendorf.
107 Alcohol Mortality.—Alkoholdodelighed. G. Poulsen.
108 Case of Leukemic Hemorrhages in Internal Ear.—Tilfaelde af leuk. Blodninger i det indre Ore. A. Kock.
109 (No. 21.) *Om Extra-systole. H. I. Bing.
110 Om Gonokok-farvning (staining). A. Brennum.
111 (No. 22.) *Indikationer og Kontraindikationer for Nefrektomi, saerligt ved Nyre-tuberkulose (of kidney). T. Rovsing.

101. **Diplobacillus Conjunctivitis.**—Lundsgaard describes the course of this conjunctivitis, which seems to be quite prevalent in Denmark. It is usually suggested by the characteristic redness of the caruncle and the margins of the eyelids, but bacteriologic examination is necessary for differentiation from ordinary epiphora or phlyctenular conjunctivitis, which it is liable to simulate at times. A 2.5 per cent. solution of zinc sulphate generally cures, but some cases do better with a zinc salve or yellow ointment.

104. **Milk Diet in Tropical Diarrhea.**—Vogelius treated a patient who had just returned from the tropics with obstinate diarrhea by putting him on a strict milk diet after failure of other attempts to disinfect the intestines. Less than a quart was allowed at first and he rapidly improved, taking two quarts and then three quarts a day, gradually resuming a mixed diet as health returned.

105. **Infantile Marasmus.**—Bloch relates the particulars of 3 more cases of general atrophy in children, which, added to those he has previously reported, makes 6 cases. In 3 cases he noted during life and at the autopsy evidences of gastric hypochylia and in the 3 others evidences of pancreatic achylia. The secreting cells of the pancreas were found empty in some of the cases; in others Lieberkühns glands were unmistakably defective. In the former group, the symptoms during life had suggested insufficiency of the pancreas. The article is accompanied by two plates and the various pathologic anatomic findings are described in detail.

106. **Chronic Parotitis.**—Lendorf reports 2 cases in which a supposed tumor in the parotid gland was found on exploratory incision to be a chronic interstitial inflammation. No calculi were found in Steno's duct nor stenosis, and the inflammation subsided under local measures—extirpation of the circumscribed mass in one case and mere fomentations in the other, with potassium iodid internally. A few similar cases are on record. Chronic parotitis may be of toxic origin, or due to syphilis, tuberculosis or actinomycosis, or secondary to calculi, sialorrhea, or a foreign body, or it may be apparently primary, as in the cases related, and may simulate a tumor.

109. **Extra Systole.**—Bing describes 4 cases of this affection in which it was the only sign of heart affection. It was probably of nervous origin in one case and secondary to diphtheria in the others.

111. **Indications and Contraindications for Nephrectomy.**—This article was read by Rovsing to open the discussion on this subject at the German Congress of Surgery last April. It is based on his experiences with 112 nephrectomies. Since 1901 the mortality in 33 cases in which the kidney had been removed on account of tuberculosis was only 3 per cent.; in 13 malignant tumors the mortality was zero, as also in 5 of hydronephrosis and pyelonephritis. In 7 cases of pyonephrosis the mortality amounted to 14.2 per cent. The mortality for these groups in the nine years before 1901 had been respectively 14.2 per cent. in 14 cases of tuberculosis and 27 per cent. in 18 malignant tumors. He thinks that the assumption, when the proportion of urea is very small, is not justified by the facts. He performed nephrectomy—notwithstanding the very low proportion of urea—in 31 out of his 112 nephrectomies, and only two of the patients succumbed to anuria. The findings with cryoscopy were frequently misleading. In 12 out of the 50 cases in which he tested the freezing point the findings were absolutely false in 12 instances, as for example, normal values with unmistakable Bright's disease. He does not accept cryoscopy, the phloridzin test nor determination of the proportion of urea as very accurate tests of kidney functioning, the last named being the most reliable. Catheterization of the ureters, with bacteriologic and chemical tests of the urine affords valuable information. If he finds bacteria, albumin and pus in the urine from the other kidney he waits until these are cured before removing its mate. But if albumin alone is found, then he performs nephrectomy, convinced that the albuminuria is of toxic origin, regardless of whether this assumption is confirmed by the freezing point or phloridzin tests or not.

Hygiea, Stockholm.

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112 (LXVII, Nos. 2-3.) *Importance of Manual Compression of Aorta in Post-partum Hemorrhages.—Betydelsen af manuell aortakompression vid blödningar i efterbördsstadiet. H. Suber.
113 Treatment of Suppurative processes in the Cornea.—Om behandlingen af suppurativa processer i hornhinnan. J. Holmström.
114 Obstetric Paralysis.—Om under förlösning uppkommen armplexus-förlämning hos fostret. E. Bovin.
115 (No. 4.) Microscopic Examination of Secretions in Supervision of Prostitutes.—Den mikr. undersökningen af sekreten vid prostitutionsbesiktningen. M. Möller.
116 New Insane Asylum.—En ny anstalt för sinnessjuka. G. Schuldheis.
117 Climatology.—General Karakteristik af Klimaterne og deres Indikationer. J. C. Holm.
118 (Nos. 5-6.) Studier öfver eksem och impetigo contagiosa. L. Moberg.
119 *Surgical Treatment of Non-suppurative Pericarditis with Effusion.—Om den kirurgiska behandlingen af den exsudativa, icke variga hjertsäcksinflammationen. S. Sjövall.
120 Till uterus-inversions kasuistik. K. Dahlgren.
121 Treatment with Bier's Artificial Hyperemia.—Sjukdomars behandling med konstgjord hyperemi enligt Bier. E. Beckman.
122 Disturbances in Orientation.—Om vilsegående. D. Andersson.
123 Should the Gall Bladder be Removed or Retained in the Ordinary Operations for Gallstones?—Bör gallblasan aflägsnas eller bibehållas, etc. J. Borelius.

112. **Manual Compression of Aorta for Postpartum Hemorrhage.**—Suber's experiences with 6 cases and another observed in Bissmark's care, has convinced him of the great efficacy of this means of arresting or preventing hemorrhage. He thinks it should be adopted as a routine measure in all severe or dangerous hemorrhages and when there is uncertainty in regard to the cause of the hemorrhage. Also in case of intervention liable to be accompanied by hemorrhage, especially when there has been much loss of blood previously. A further indication is to gain time for aseptic and rational measures to arrest the hemorrhage in some other way. It is also indicated when the uterus reacts feebly or not at all to mechanical procedures, and when the circumstances forbid further loss of blood. It also renders it possible to postpone an intervention until conditions are more favorable for its success. He adds that compression of the aorta is liable to prove extremely important also in hemorrhage from inversion or rupture of the uterus or from abortion or mole.

119. **Surgical Treatment of Pericarditis with Effusion.**—Sjövall's communication may be summarized in the advice to operate at once in every case of pericarditis with effusion, not suppurative. The intervention should be pericardotomy, preferably Ollier's technic. The accumulation of the effusion impedes the action of the heart, and its removal is a necessity, as he shows by relating his experience with two patients, each 16 years old, both restored to health by simple pericardotomy. In one pericarditis had followed acute articular rheumatism.

Books Received

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CHANGES IN THE PHARMACOPEIA OF THE UNITED STATES OF AMERICA, Eighth Decennial Revision (Official from Sept. 1, 1905). R. Hunt and M. O. Motter. Paper. Pp. 122. Washington: Government Printing Office, 1905.

ANNUAL PRICE CURRENT, DRUGS, CHEMICALS, MEDICINES. Cloth Pp. 1380. Chicago: Peter Van Schaack & Sons, Wholesale Druggists, 1905.

TENTH BIENNIAL REPORT OF THE NORTH CAROLINA BOARD OF HEALTH, 1903-1904. Paper. Pp. 109. Raleigh: E. M. Uzzell & Co., 1905.